

Mountain Vistas Tract 37-54 Mono County, California

Preliminary Base Flood Elevation Study

***Prepared for:
D. Anthony Mize
WF FUND II, LLC
10621 Civic Center Drive
Rancho Cucamonga, CA 91730***

Project 4-0180-1

June 2005

Engineer:
triad/holmes associates

Post Office Box 1570
Mammoth Lakes, Ca 93546
Phone: (760) 934-7588
Fax: (760) 934-5619
triad@triadholmes.com
David Lavery, LS, Principal
Tom Platz, RCE, Principal



Preliminary Base Flood Elevation Study

***Mountain Vistas
Tract 37-54
Mono County, California***

INDEX

1 – Project	1
2 – Objective.....	1
3 – Assumptions	1
4 – Project Background	2
5 – Observations.....	2
6 – Calculations	3
7 – Conclusions.....	5

APPENDIX

Figures	A
Quad Map of Area (With Cross Section Locations) and flood limits	1
Site Map with Base Flood Elevation (BFE) Contours shown.....	2
 Hydraulic Calculations – Existing Conditions, Complete Section	B
 Hydraulic Calculations – Existing Conditions, Chalfant Road - West	C
 Hydraulic Calculations – Proposed Conditions	D
 Hydrology Calculations – WRC Nevada, Inc. – July 11, 2003	E

Preliminary Base Flood Elevation Study Mountain Vistas

1 - Project

The project is located in Chalfant Valley, Mono County, California. The town of Chalfant is adjacent and across Highway 6 from the project. The project is also located on State Highway 6. Bishop, California is located approximately 12 miles south of the project.

The project is for the subdivision of approximately 29 acres into 48 lots. Infrastructure will be installed including access roads, water, sewer, electricity, phone and cable television. Homes will be constructed on each lot. The assumed home size for each lot is approximately 2000 square feet. All lots will be 0.43 acres or greater.

2 - Objective

The objective of this study is to determine the Base Floodplain Elevation over the subject site. This information will be used to evaluate potential impacts of the future subdivision. A final Base Floodplain Elevation study will be required to set the finished floor elevations for the homes.

3 - Assumptions

Based on the study performed by WRC Nevada and attached as Appendix F, we have selected to use a runoff flow of 10,000 cfs to determine the Base Floodplain Elevations. It is the opinion of both Triad/Holmes Associates and WRC that this is a conservative estimate.

The benchmark for this site is at an elevation above mean sea level as shown on the Base Flood Elevation Map.

Cross Sections were shot generally perpendicular to the direction of the Channels in the area. In the area of Chalfant Road, the cross sections were rotated to hit the road parallel, based on the assumption that this road would create a damming effect on the flow.

Many things can create local alterations to the direction of a flood in a flat area, such as this one. These calculations are based on diverting a maximum flow to the project site with U.S. Highway 6 acting as a weir for flood flows to the east.

4 – Project Background

The FEMA mapping does not address flood flows in the area of the proposed project. This FEMA map was created based on USGS quad mapping. This USGS quad mapping is lacking in topographic relief in the Chalfant Valley. Based on known flood observations and field investigation, it was determined that ground survey would be required to determine more accurate Base Flood Elevations.

Field survey of the Valley shows that generally a significant portion of total flood waters will flow southeast toward the subject site. For purposes of this study we have conservatively assumed that the entire flood flow of 10,000 cfs flows toward the subject site.

The most recent known flooding event was in 1989. In that event flood levels of 3-6 inches were observed in some areas. Many people installed berms to divert flow during the storm. Flood waters were not identified at the Chalfant store but were identified immediately to the south at the Fire Department Building and at the park.

5 - Observations

The project was investigated both in the field and on available maps such as FEMA and Quad maps.

Soils in the area are generally sand. Vegetation is sparse desert type vegetation, mostly sagebrush. There are very few clear drainage channels.

The project is located in a desert type climate. The site is very flat; the average slope through the project site is at a rate of 0.004 feet per foot.

Field observations were made of runoff. The site was surveyed at cross-sections, perpendicular to the assumed direction of flow for a flood of 10,000 cfs. It is assumed that Chalfant is perpendicular to the flow path. Due to this cross sections have been set to match this condition. The direction of flow for smaller floods could vary significantly, due to the flatness of the area.

The cross sections indicate that flood level waters are generally coming from the north, west of Highway 6, and flowing almost directly toward the site. Highway 6 will somewhat contain the runoff allowing weir overflow east to the town of Chalfant. Additionally, Chalfant will act as an inline weir in the channel.

6 - Calculations

Based on the field observations and surveyed cross-sections, calculations were run to determine maximum flow potential and base flood elevations on the subject site. For calculation purposes, it was conservatively assumed that none of the 10,000 cfs crossed US Highway 6 north of the project site or in other words the total flow was assumed to be directed at the proposed project. Additionally, though some runoff will be contained west of this project, all runoff was allowed to hit the project site. This gives the highest potential water surface elevation for this site.

All calculations were prepared using the latest version of the Haestad, HecRas (Hydraulic River Analysis) program.

Base Run – Existing Conditions:

- First, runs were made that consider the entire cross section as a whole. The cross sections were entered. A fixed amount of 10000 cfs was added at station 9, and a normal depth flow with a slope of 0.004 was placed at each end. In these, the elevation of the water on the project site west of Highway 6 are very low, indicating little or no flood waters on the subject property. These results are shown in Appendix B. Since we believe the water gets trapped by Highway 6, additional work was performed.

- Calculations were made along the west side of the Highway 6 (and across the project site). A lateral structure was added to the sections to approximate Highway 6. Interpolated sections were added to limit distance between sections for more accurate calculations. The Hecras Calculations were based upon a mixed flow condition (though all of the results were subcritical). A fixed amount of 10000 cfs was added at station 9, and a normal depth flow with a slope of 0.004 was placed at each end. The geometric preprocessor was run to set weir overflows prior to steady flow calculations. The runoff quantity contained by U.S. Highway 6 in the area of the site varies from approximately 10000 cfs at the north to approximately 9000 cfs at the south exit of the property. These results are shown in Appendix C.
- Historically, flood water damns up at the site, behind Chalfant Road. Therefore the sections around Section 4.7 were adjusted to represent the effect of Chalfant Road. Elevations were adjusted to simulate the condition created by Chalfant Road.
- To verify that Highway 6 would act as a free overflow weir, the calculations included in Appendix B were reviewed. These calculations indicate that even 10,000 cfs flowing to the east of Highway 6 would produce elevations lower than the weir elevations.

HecRAS with Proposed Conditions:

- The proposed features were added to the sections. This includes obstructions placed at the approximate location of new homes.
- Though we do not expect to be able to define potential commercial structures for more than 2 years, we expect that there will be buildings placed at the location of the Commercial site. Therefore, to have an idea what effect might be made by a commercial building, a 10,000 square foot building was added to the commercial lot. If a building is propose that is significantly greater than 10,000 square feet, additional analysis will be needed.
- At this point, both a sound wall and berms are proposed along Highway 6. The proposed sound wall was placed as a lateral structure, with openings as required. The berms will be in line with the soundwall, and the openings will continue through them. Openings were created by making 8 feet wide by 8 inches high culverts through the lateral structure at 60 foot intervals to match the proposed sound wall

openings. The actual construction of these may differ, but the total opening area will need to be set based on the Final Base Flood Elevation Study. This will probably change somewhat once all final considerations are made. Obstructions were placed at the location of the north sound wall. This will closely simulate the conditions created by the present design. Other options that include similar openings would be modeled in the same way. Therefore any soundwall design chosen that has similar openings would work the same as this consideration.

- The program was again run using all of the same considerations as the base run.
- This shows that in the area of this site the base flood elevation will be raised a maximum of 0.12 feet. At the exit limit of the site (station 4.7) the post development elevation matches the predevelopment elevation. Above and below the project site, the elevation is within 0.02 feet. A table showing the water surface elevation differences is included in the Calculations. Approximately 150 cfs additional runoff out of the total of 10,000 cfs is contained on the project site at station 4.7. Therefore there is minimal effect on the elevation of the water and the runoff quantity at the cross sections at the limits of the property. The results of this are shown in Appendix D.

7 - Conclusions

A flood with an intensity of 10,000 cfs would create a maximum depth of 3.5 feet above a future roadway, which is preliminarily designed below natural grade. Generally maximum depth of water surface across the lots is 2 feet or less. The finished floors of future homes should be built above the base flood elevations set by this study. These elevations must be determined based on the actual location of the home on the lot. The map, Figure A.2, can be used for this determination. Homes must be built to conform fully to FEMA requirements. This includes, but is not limited to the installation of required openings in the homes 'crawl space' to effectively balance hydrostatic pressure from storm water flows.

As shown in the calculations the development of homes on the subject property would not have a significant effect on a flood event. Roads will be built to reduce impact of the installation of homes, essentially adding flow area for flood waters. Given the large size of the area, the very low velocities and in comparison the small size of homes, installation of

homes on this site will have an insignificant effect on upstream, downstream, or adjacent property flooding in the subject area. It is advised that generally driveways and roads be constructed essentially at grade so as not to significantly obstruct the flow of a storm.

Recommended mitigation measures for this project include the construction of the homes such that the finished floor elevations are above the base flood elevations indicated on Figure A2. Homes must be built to conform fully to FEMA and Mono County requirements. This includes, but is not limited to the installation of required ventilation for the homes 'crawl space'. Lot grading shall be kept to a minimum. Utilities will need to be protected both in the underfloor and at the centralized service areas. This includes but is not limited to water, sanitary sewer, propane and ventilation ducting.

Driveways and roads shall be constructed essentially at grade and shall not be constructed to obstruct the flow of a storm. As much as is practicable homes built in a row perpendicular to the flood flow path shall be minimized.

Openings shall be included in the sound wall adjacent to Highway 6 to balance flow between this site and the area to the east. Erosion protection shall be provided at the openings based on final calculations for velocities at these openings. Fences shall not be allowed that would affect flood flows. Fences planned at the well locations must be maintained such that debris does collect.

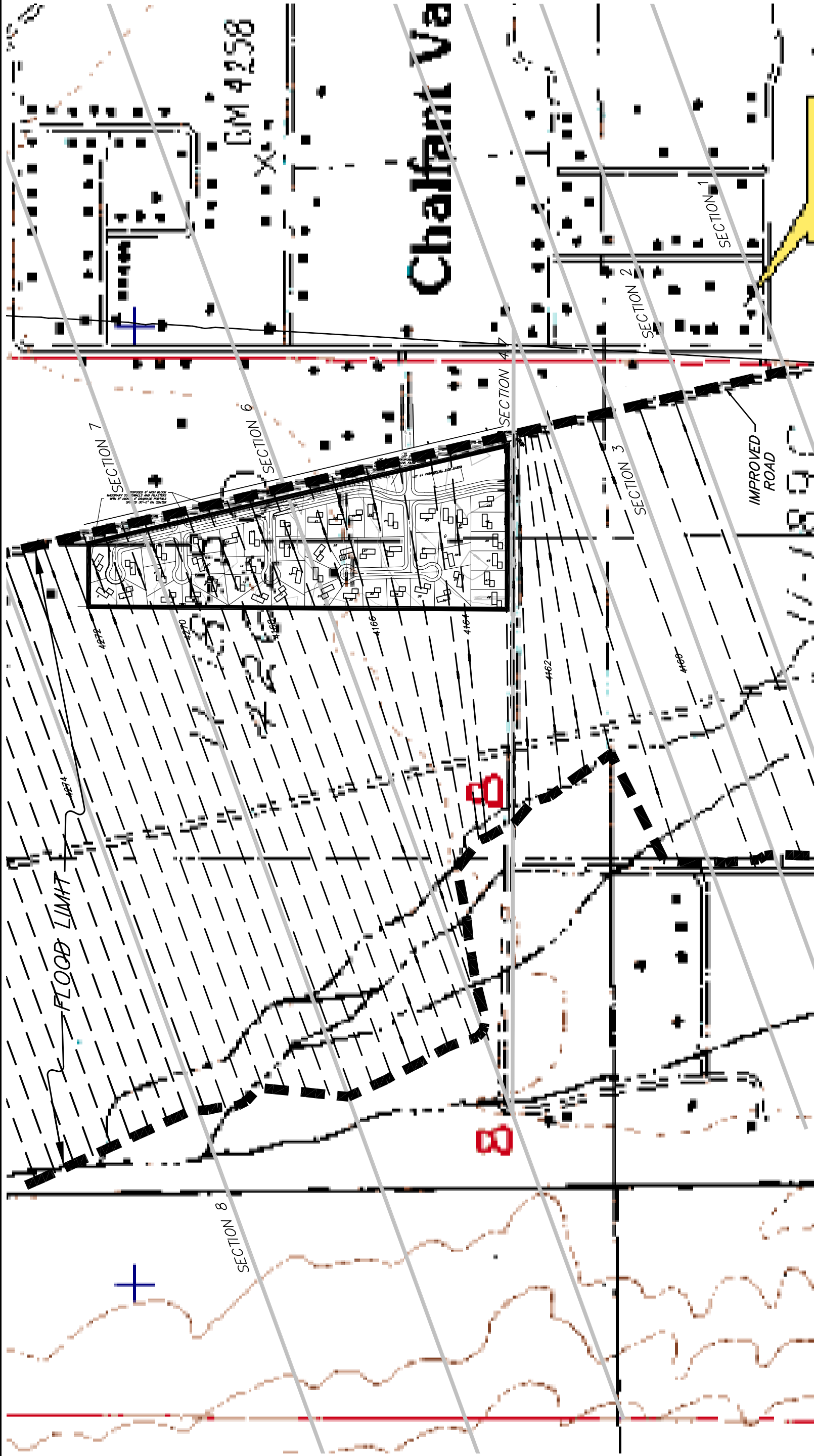
Base flood elevations shown in this study are preliminary based on an initial study of this area. Final base flood elevations will be set based on a base flood elevation study as prepared and approved during the improvement plan process.

This study was performed to determine Base Flood Elevations for this site only. These results should not be used for any other sites.



Preliminary Base Flood Elevation Study
Mountain Vistas

Appendix A
Figures



NOTE:

BASE FLOOD ELEVATIONS SHOWN ON THIS MAP ARE PRELIMINARY BASED ON AN INITIAL STUDY OF THIS AREA. FINAL BASE FLOOD ELEVATIONS WILL BE SET BASED ON A BASE FLOOD ELEVATION STUDY AS PREPARED AND APPROVED DURING THE IMPROVEMENT PLAN PROCESS. ALL HOMES SHALL BE SET TO ELEVATIONS AS REQUIRED BY THE MONO COUNTY FLOOD ORDINANCE AND SHALL CONFORM FULLY TO FEMA REQUIREMENTS. THIS INCLUDES BUT IS NOT LIMITED TO THE INSTALLATION OF REQUIRED VENTILATION FOR THE HOMES "CRAWL SPACE".



LEGEND

- SUBJECT TRACT LINE
- PROPOSED LOT LINES
- CENTERLINE
- BASE FLOOD CONTOUR FOR 100 YR. FLOOD
- FLOOD LIMIT

FIGURE A.1

SPECIFIC PLAN TENTATIVE TRACT MAP NO. 37-54
FLOOD LIMITS - QUAD MAP
PREPARED FOR: D. ANTHONY MIZE/ WORK FORCE HOME BUILDERS, LLC.



land/homes assoc
civil engineering
land surveying
1100
529 ad
phone
fax
email
214 west line st. suite 4
phone
fax
email
555 shorro st. suite 9
phone
fax
email
210 west center avenue suite 4
phone
fax
email
1000
phone
fax
email
1000
phone
fax
email

Copyright (C) 2003 by
land/homes assoc
All rights reserved. No
part of this document may be
reproduced or transmitted in
any form or by any means
electronic or mechanical,
including photocopying,
recording, or by any
information storage and
retrieval system, without
the prior written permission
of land/homes assoc.

REVISIONS	BY
DATE	6/03/05
SCALE	1"=500'
DRAWN	AH/OFG
JOB NO.	4-0180
DWG	4-0180T1M4
SHEET	
OF	SHEETS

BASE FLOOD ELEVATIONS



REVISIONS				
BY				
DATE	6/03/05			
SCALE	1"=80'			
DRAWN	AH/OFG			
JOB NO.	4-0180			
DWG	4-0180TTH4			
SHEET				



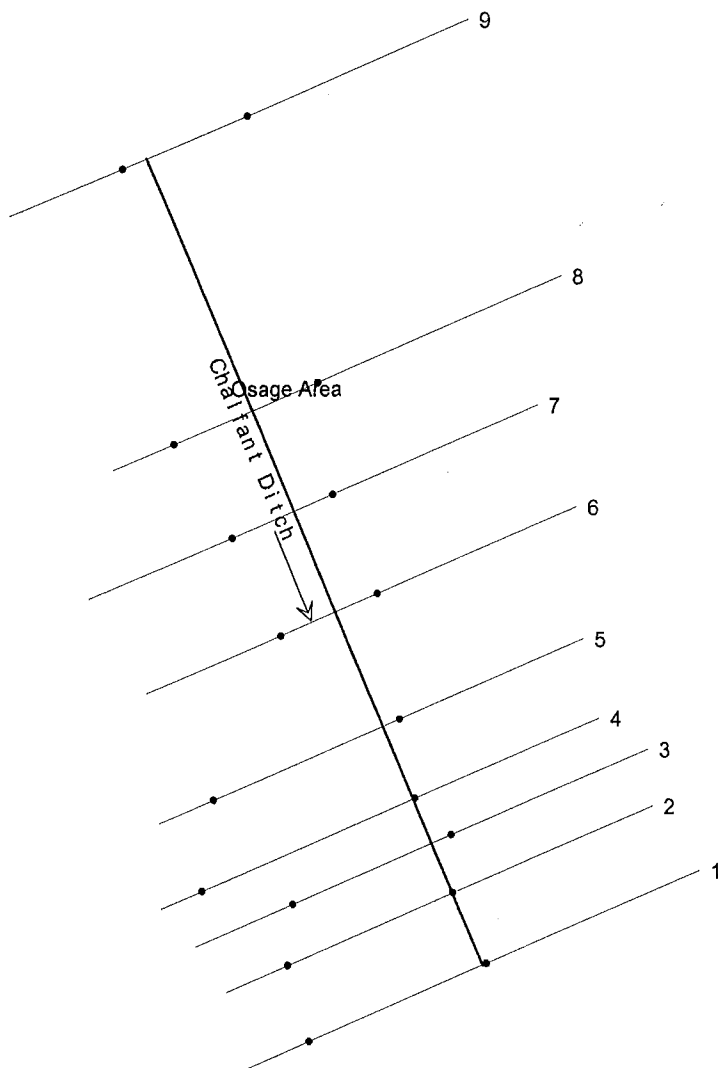
BASE FLOOD ELEVATIONS SHOWN ON THIS MAP ARE PRELIMINARY BASED ON AN INITIAL STUDY OF THIS AREA. FINAL BASE FLOOD ELEVATIONS WILL BE SET BASED ON A BASE FLOOD ELEVATION STUDY AS PREPARED AND APPROVED THROUGH THE IMPROVEMENT PLAN PROCESS. ALL HOMES SHALL BE SET TO ELEVATIONS AS REQUIRED BY THE MONO COUNTY FLOOD ORDINANCE AND SHALL CONFORM FULLY TO FEMA REQUIREMENTS. THIS INCLUDES BUT IS NOT LIMITED TO THE INSTALLATION OF REQUIRED VENTILATION FOR THE HOMES "CRAWL SPACE".

FIGURE A.2



Preliminary Base Flood Elevation Study
Mountain Vistas

Appendix B
Hydraulic Calculations
Existing Conditions, Complete Section



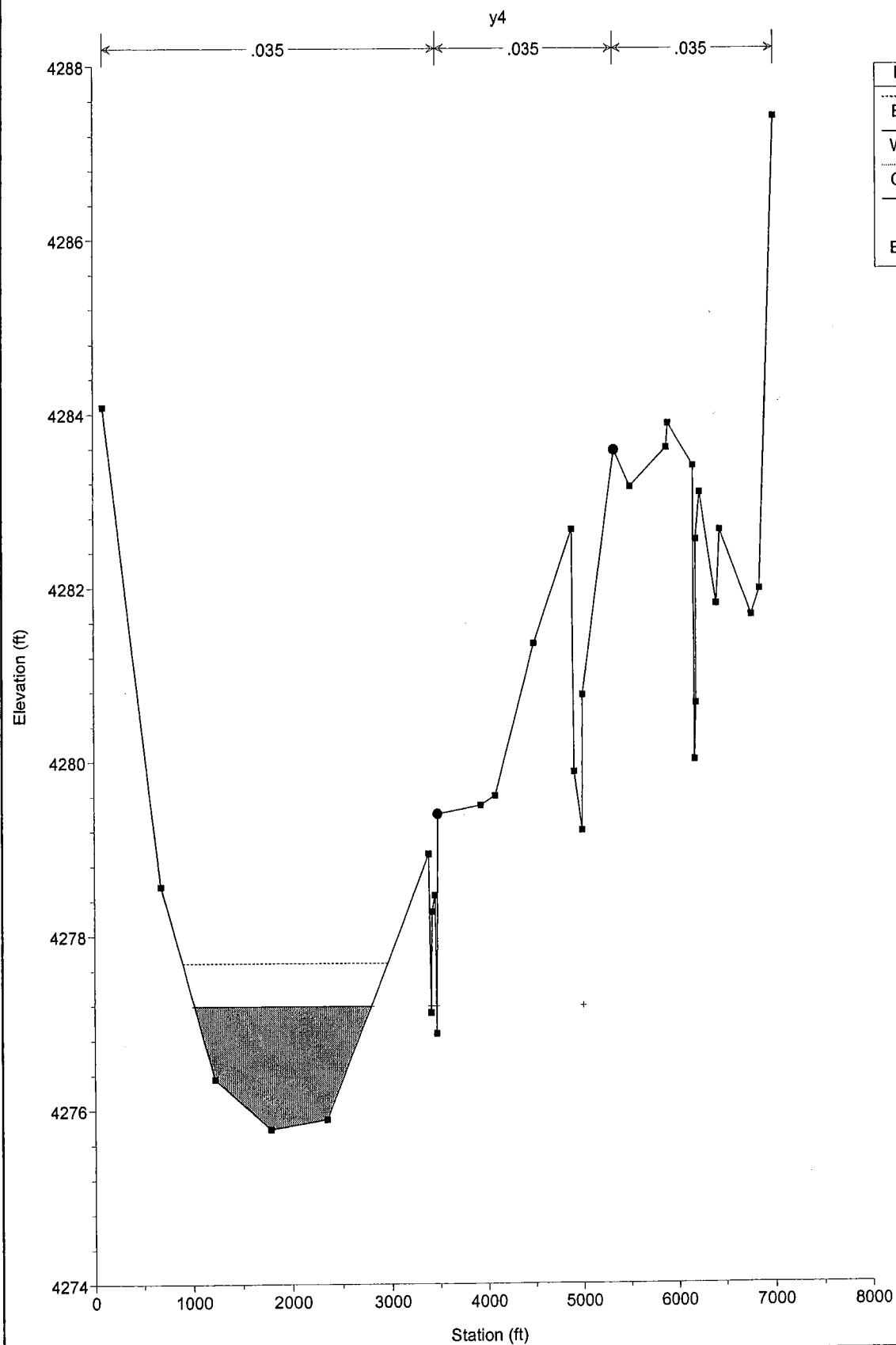
HEC-RAS Plan: Entire Sec River: Chalfant Ditch Reach: Osage Area Profile: PF 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Osage Area	9	PF 1	10000.00	4279.20	4277.19	4277.19	4277.68	0.017978		1765.66	1784.03	0.00
Osage Area	8	PF 1	10000.00	4271.77	4269.94	4267.77	4270.00	0.000626		5139.64	2140.22	0.00
Osage Area	7	PF 1	10000.00	4268.18	4268.14	4268.14	4268.61	0.018621		1818.18	1967.83	0.00
Osage Area	6	PF 1	10000.00	4264.61	4262.83	4260.08	4262.91	0.000605		4578.88	1513.00	0.00
Osage Area	5	PF 1	10000.00	4260.51	4260.99	4260.99	4261.45	0.014297	1.81	1875.88	2191.76	0.69
Osage Area	4	PF 1	10000.00	4258.25	4259.96	4258.90	4260.00	0.000757	1.25	6399.39	4322.36	0.21
Osage Area	3	PF 1	10000.00	4257.62	4259.26		4259.42	0.007352	2.75	3145.56	3998.73	0.60
Osage Area	2	PF 1	10000.00	4256.57	4258.40		4258.46	0.001267	1.28	5176.13	3970.95	0.26
Osage Area	1	PF 1	10000.00	4255.25	4256.50	4256.50	4256.82	0.014188	3.97	2306.24	3037.73	0.84

4-180 Chalfant Brown Entire Section

Plan: Chalfant Brown Entire Section

4/15/2004

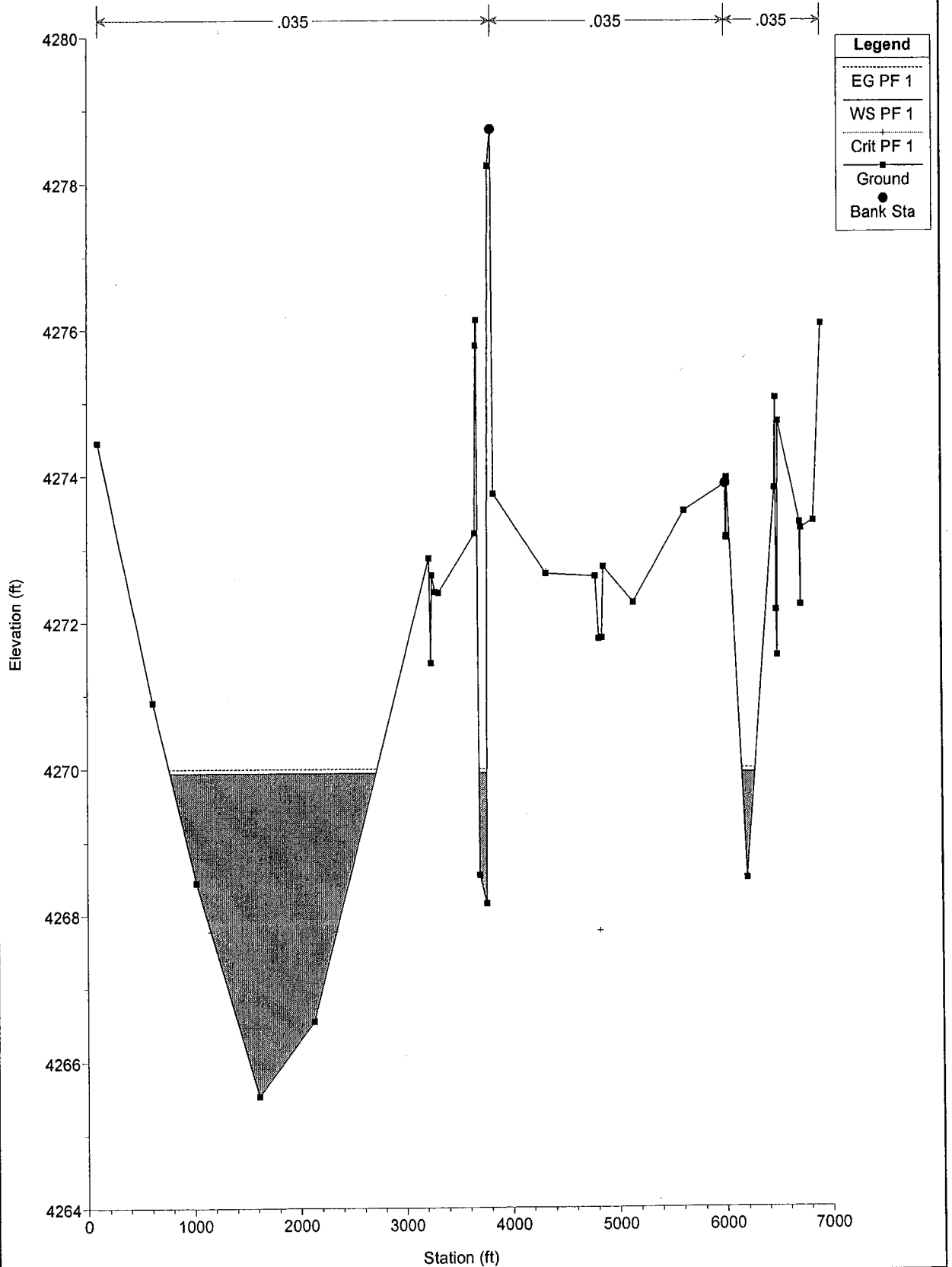


4-180 Chalfant Brown Entire Section

Plan: Chalfant Brown Entire Section

4/15/2004

y3

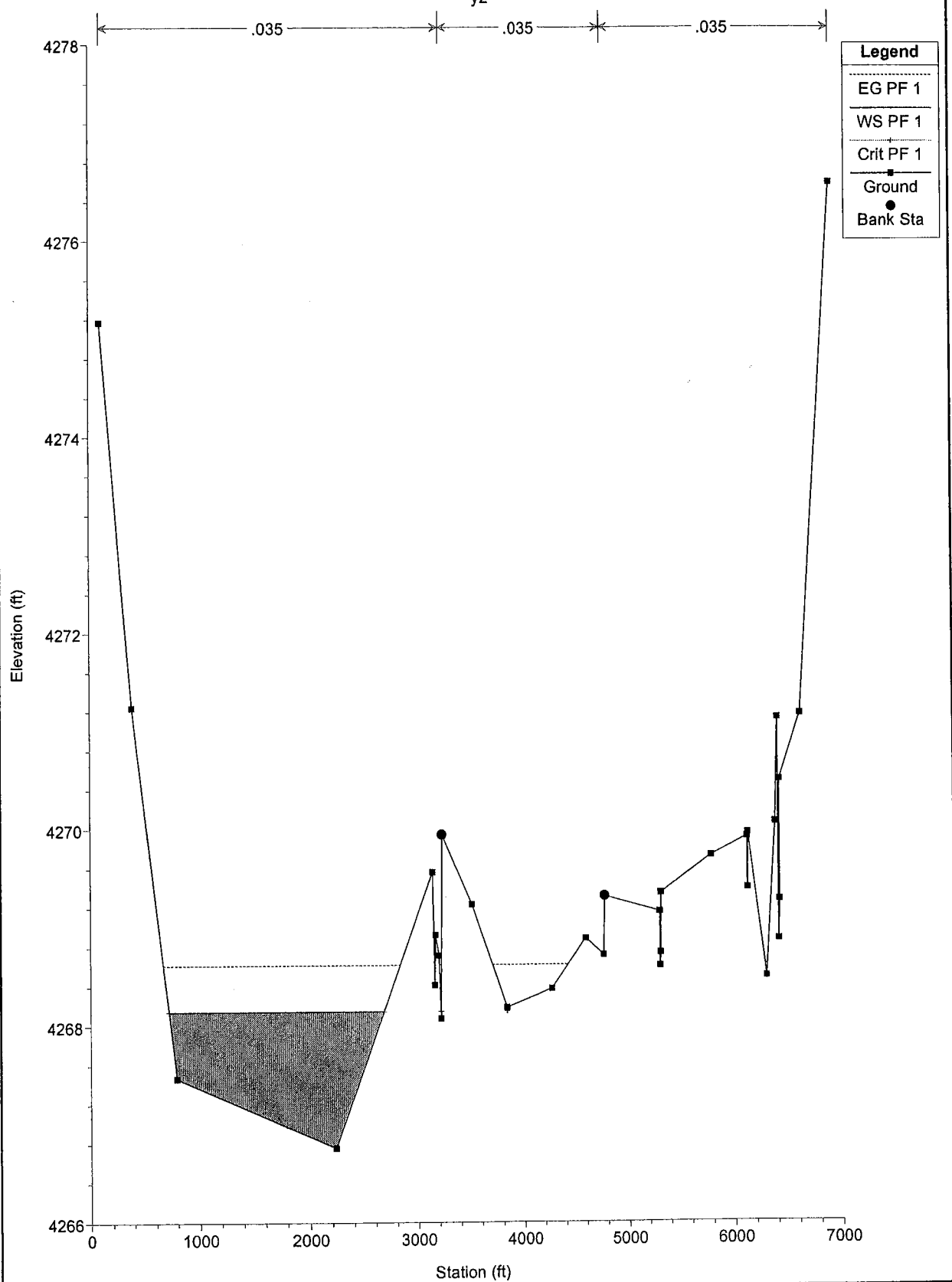


4-180 Chalfant Brown Entire Section

Plan: Chalfant Brown Entire Section

4/15/2004

y2

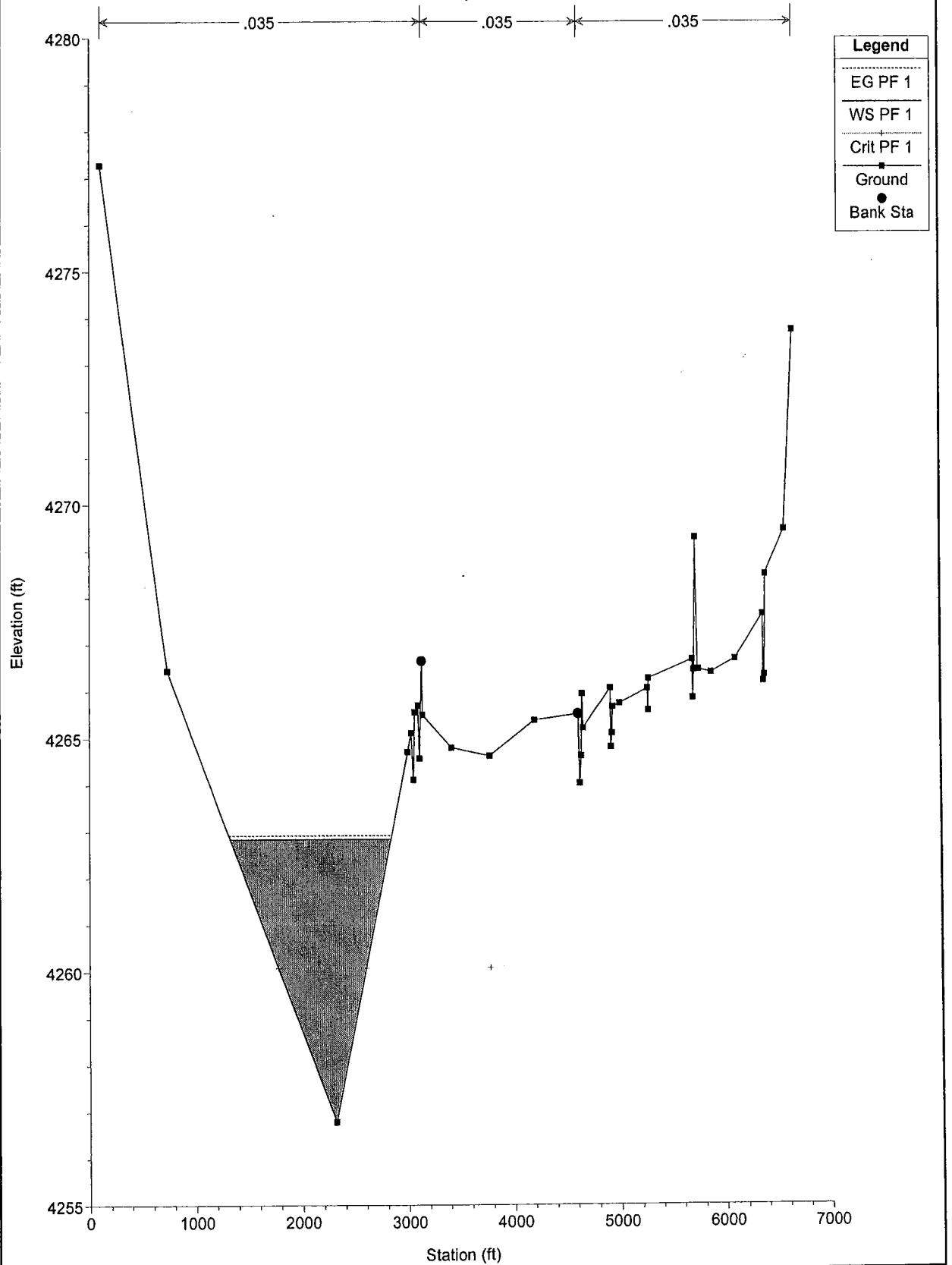


4-180 Chalfant Brown Entire Section

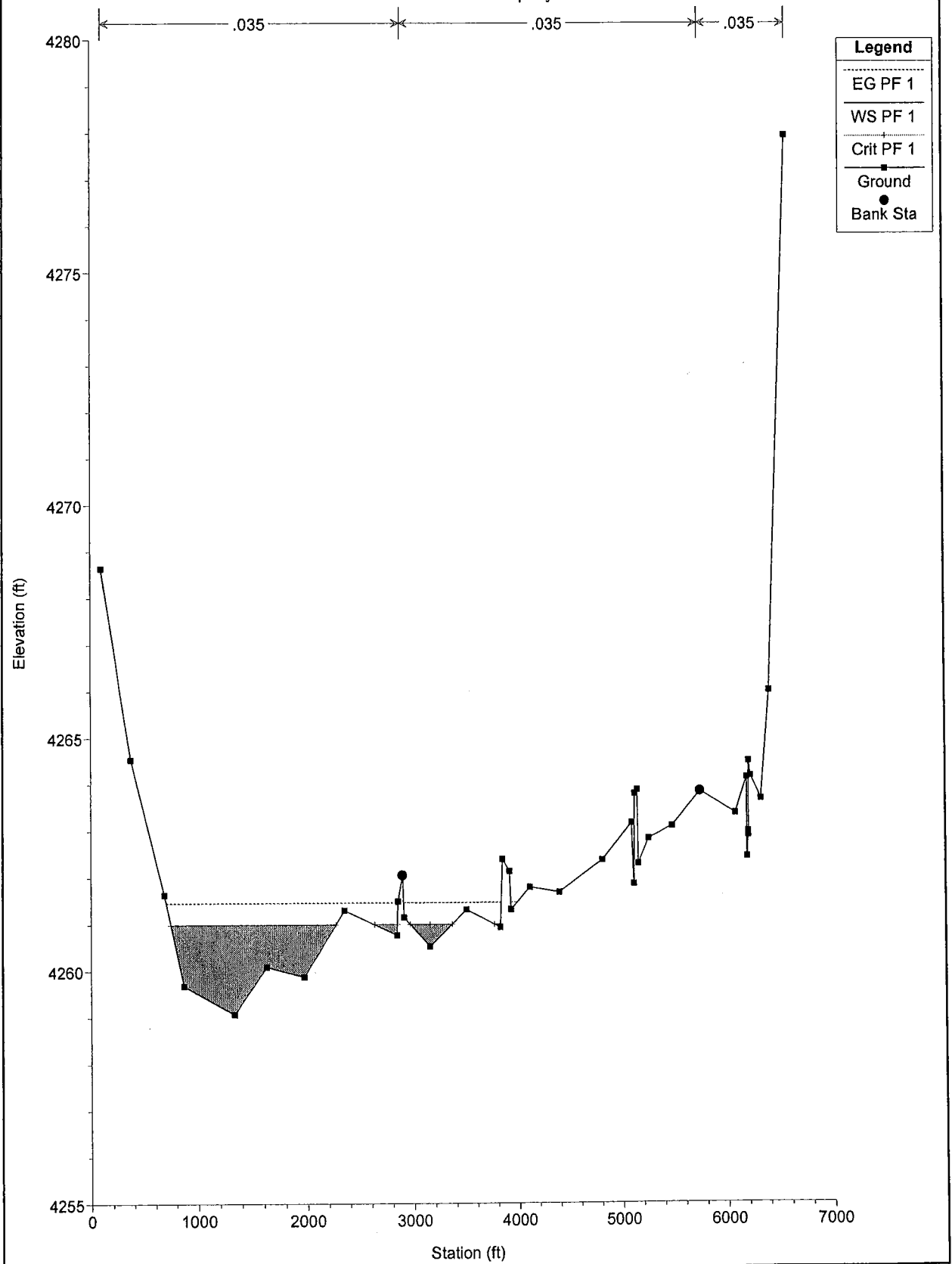
Plan: Chalfant Brown Entire Section

4/15/2004

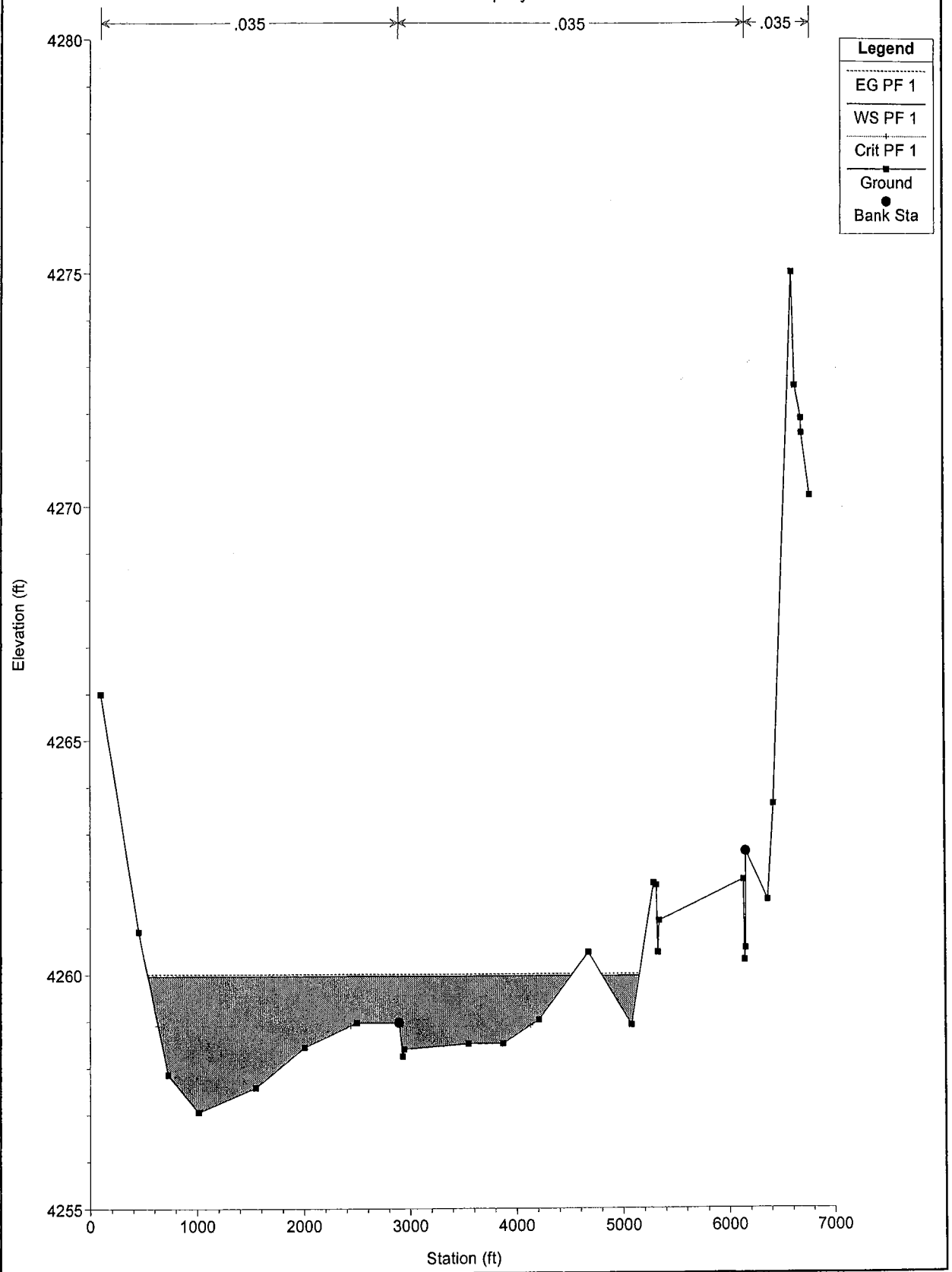
y1



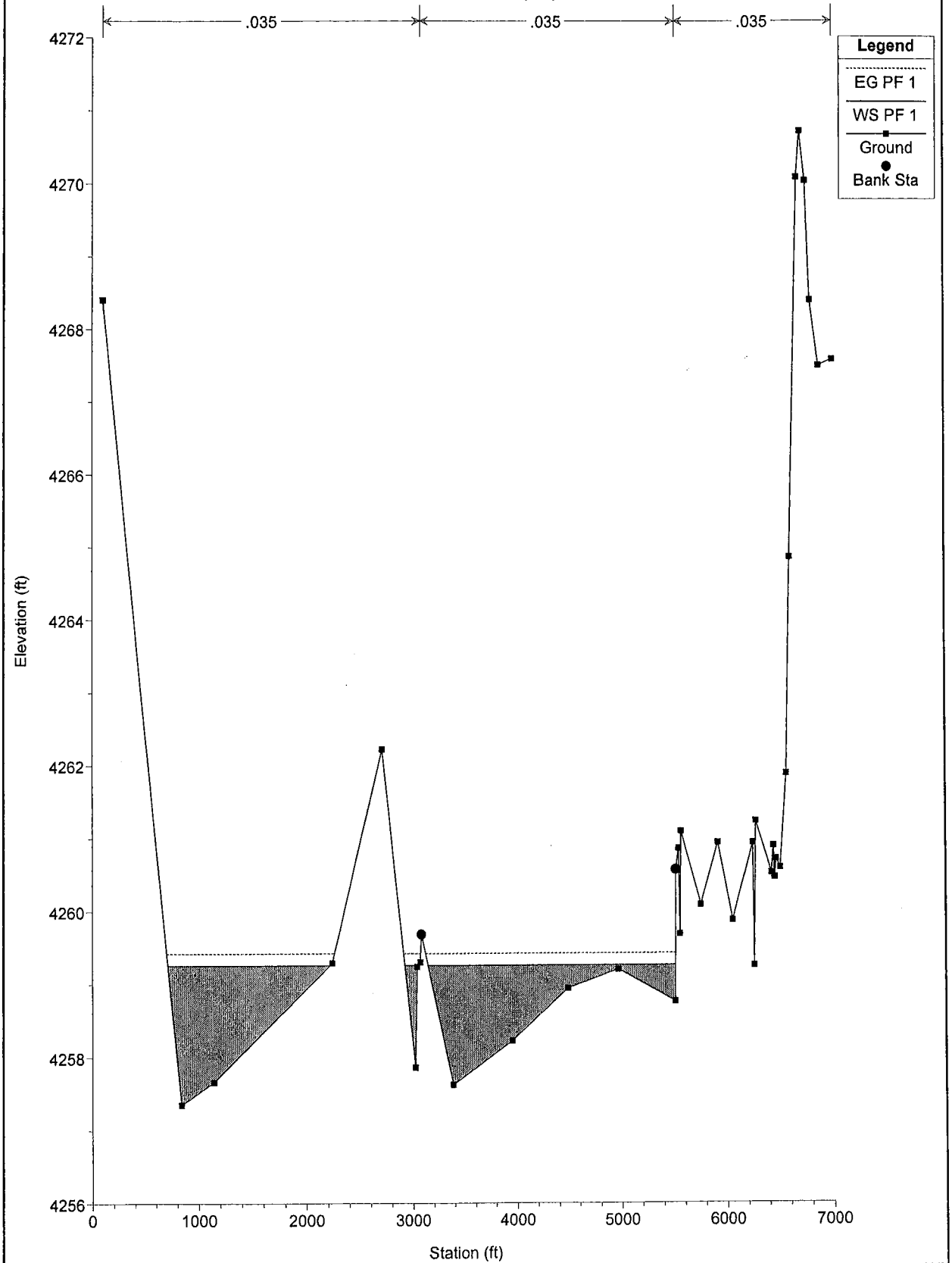
4-180 Chalfant Brown Entire Section Plan: Chalfant Brown Entire Section 4/15/2004
 X3 - North of Property



4-180 Chalfant Brown Entire Section Plan: Chalfant Brown Entire Section 4/15/2004
X4 - North Property Line



4-180 Chalfant Brown Entire Section Plan: Chalfant Brown Entire Section 4/15/2004
X5 - Center of Property

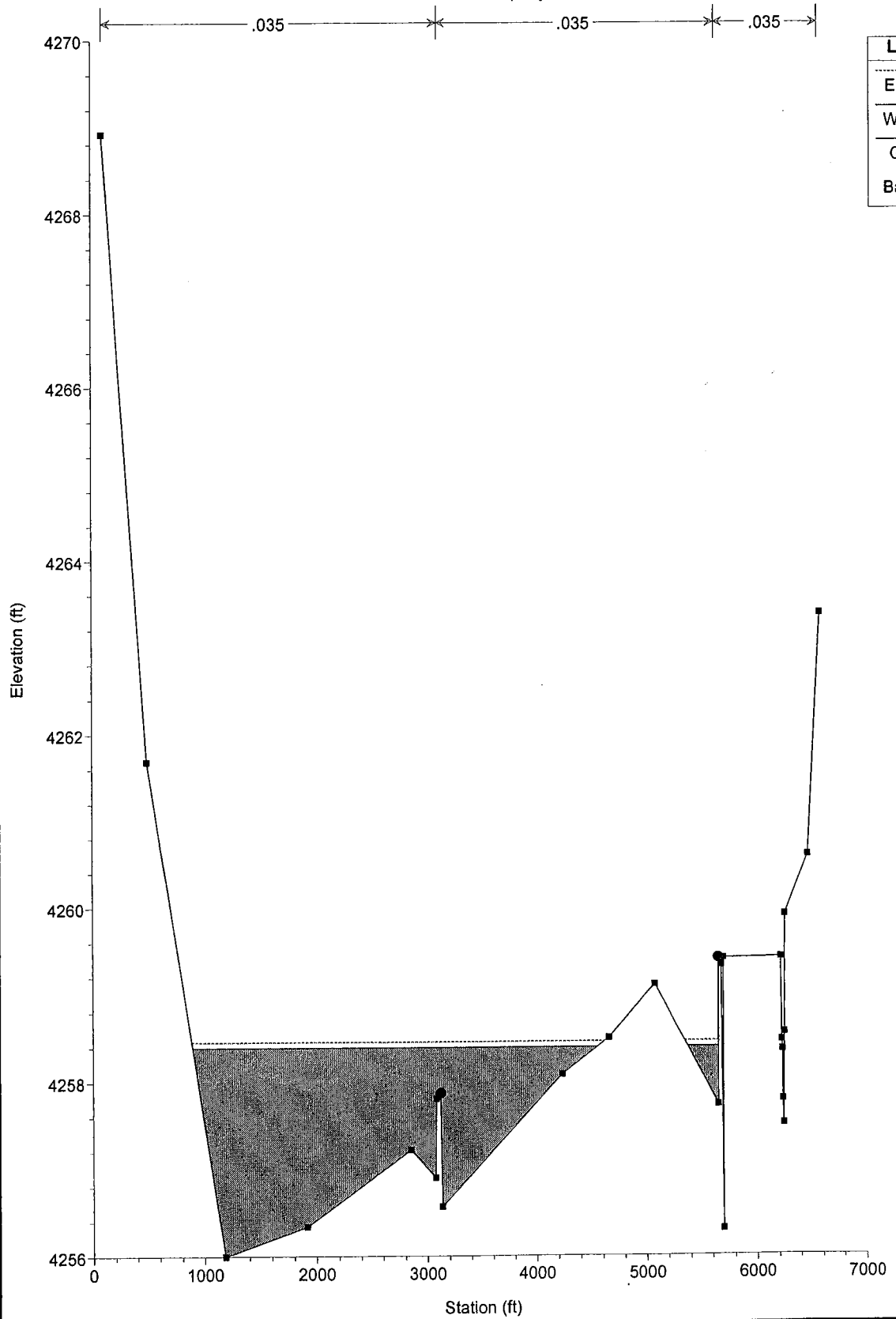


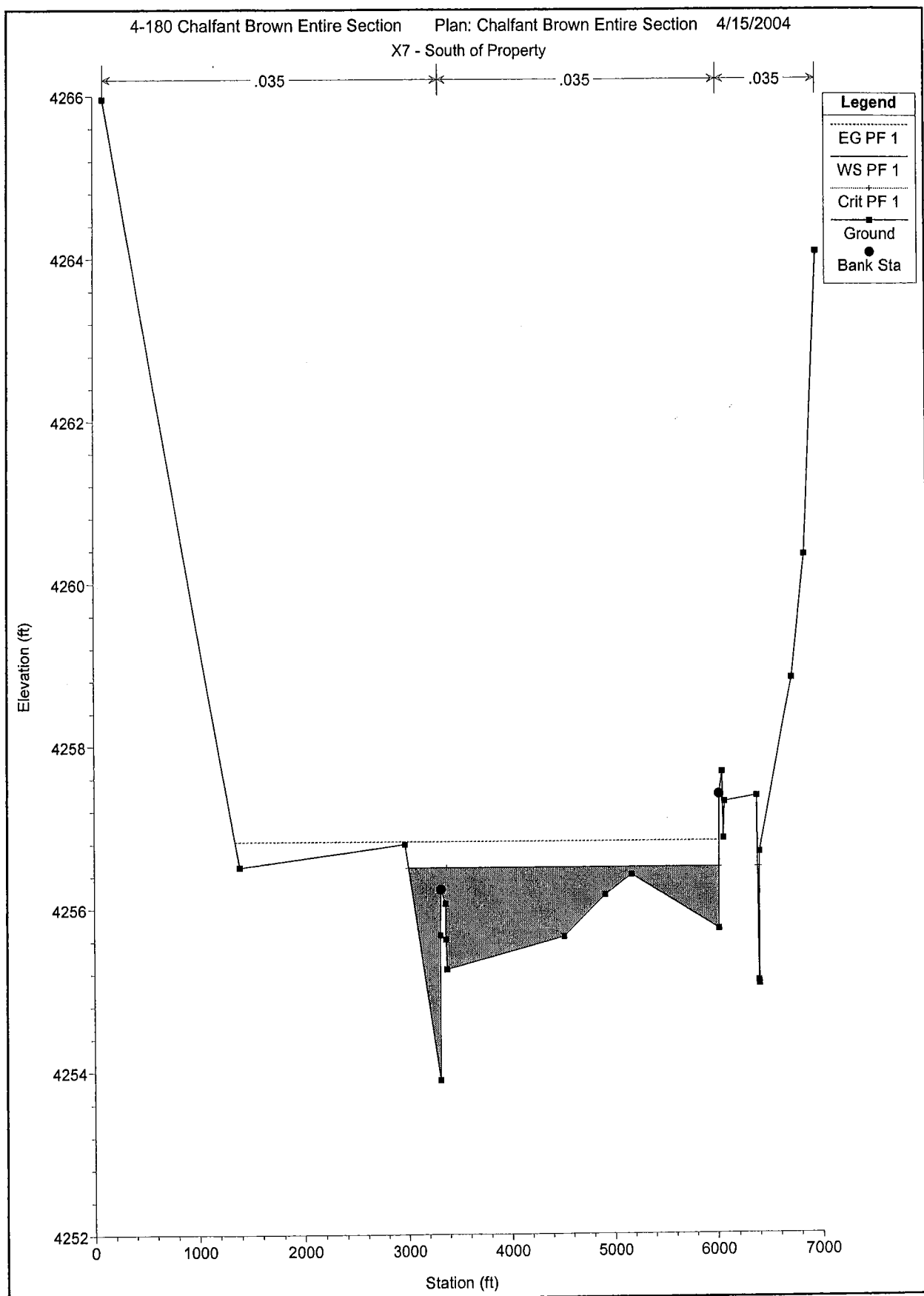
4-180 Chalfant Brown Entire Section

Plan: Chalfant Brown Entire Section

4/15/2004

X6 - South Property Line

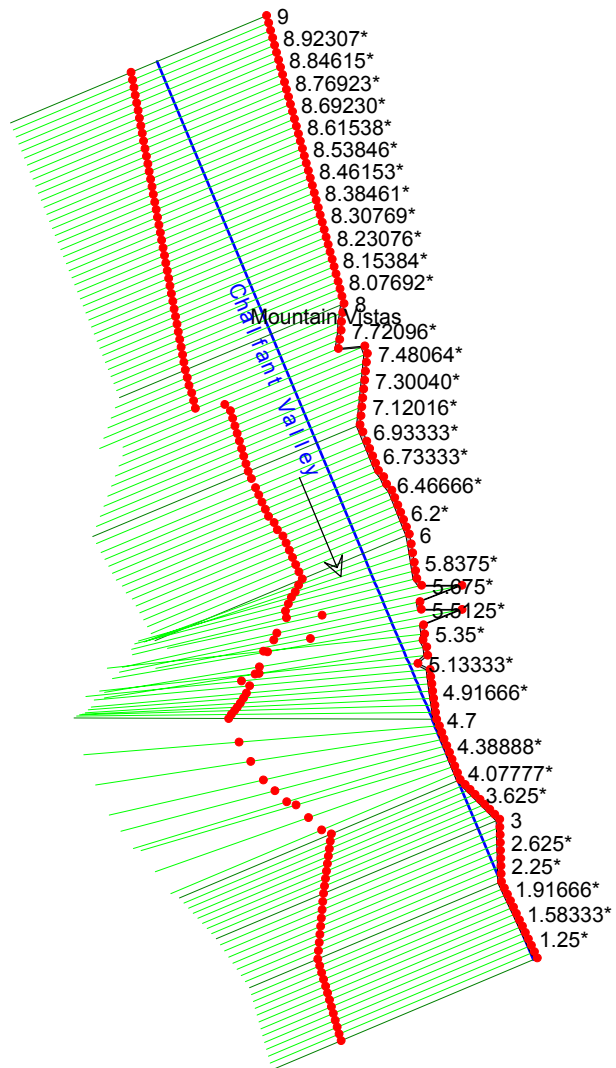






Preliminary Base Flood Elevation Study
Mountain Vistas

Appendix C
Hydraulic Calculations
Existing Conditions

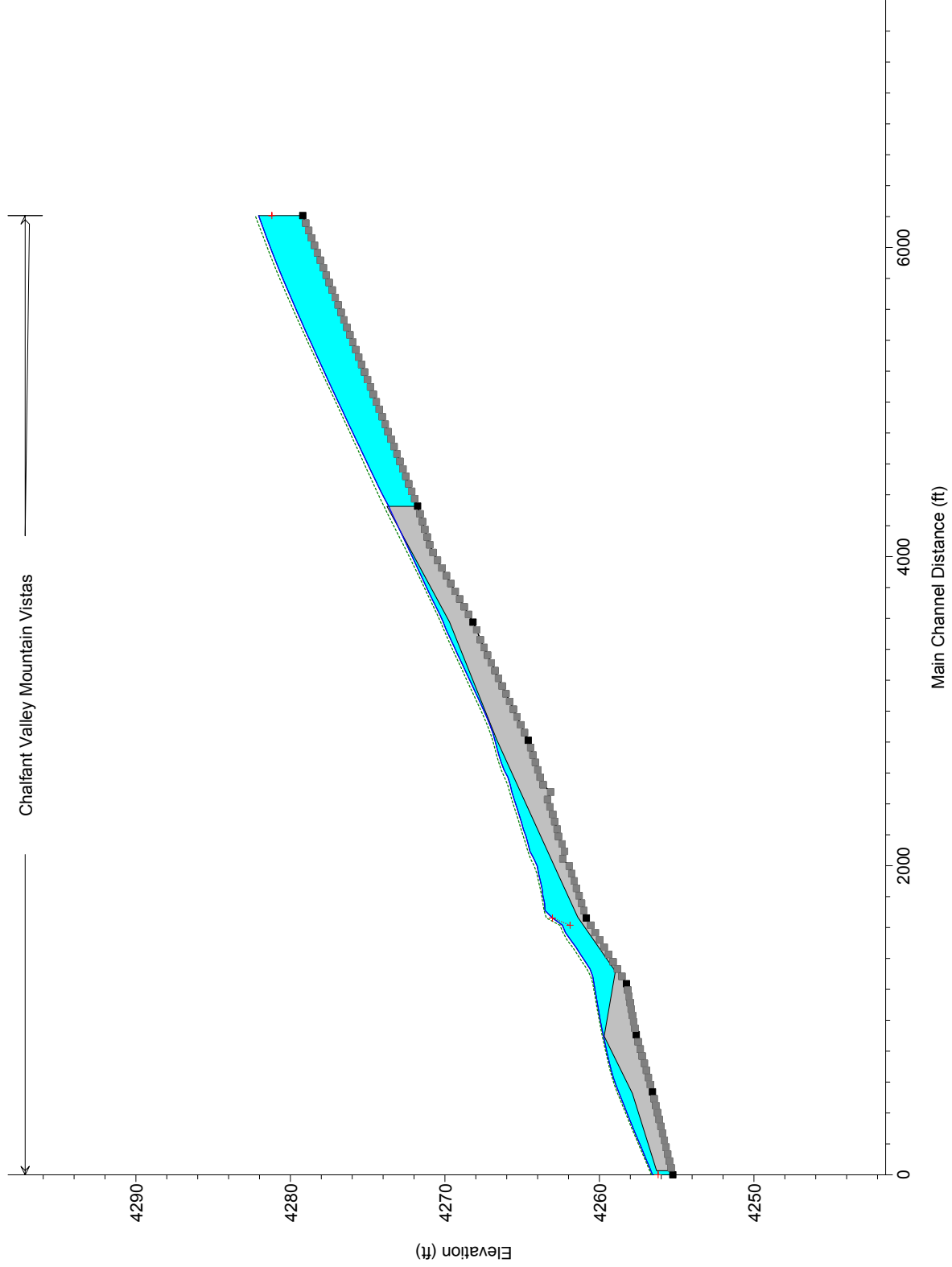


4-180 Pre chalfant R5 Plan: Plan 01 6/20/2005 3:14:54 PM

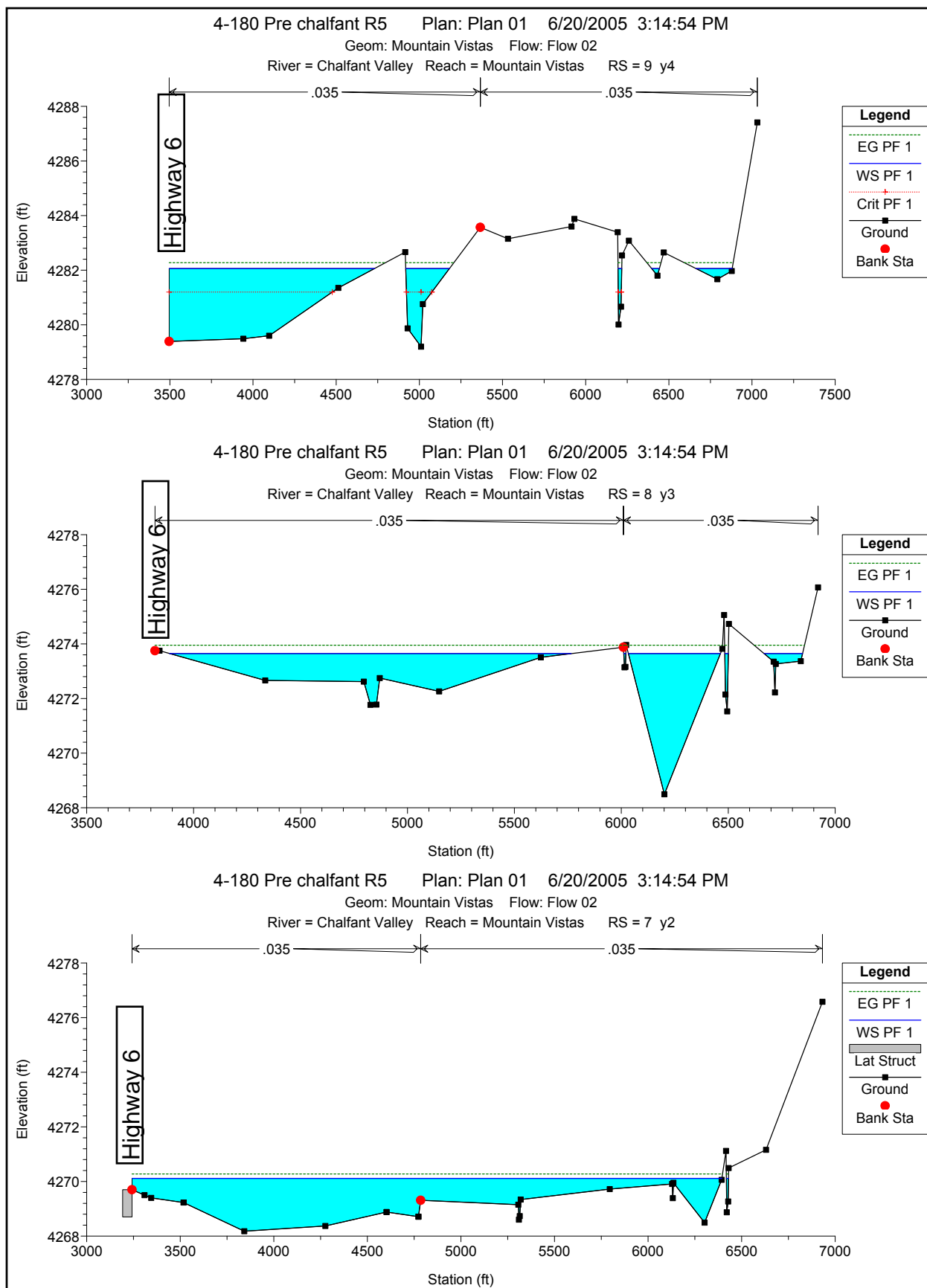
Geom: Mountain Vistas Flow: Flow 02

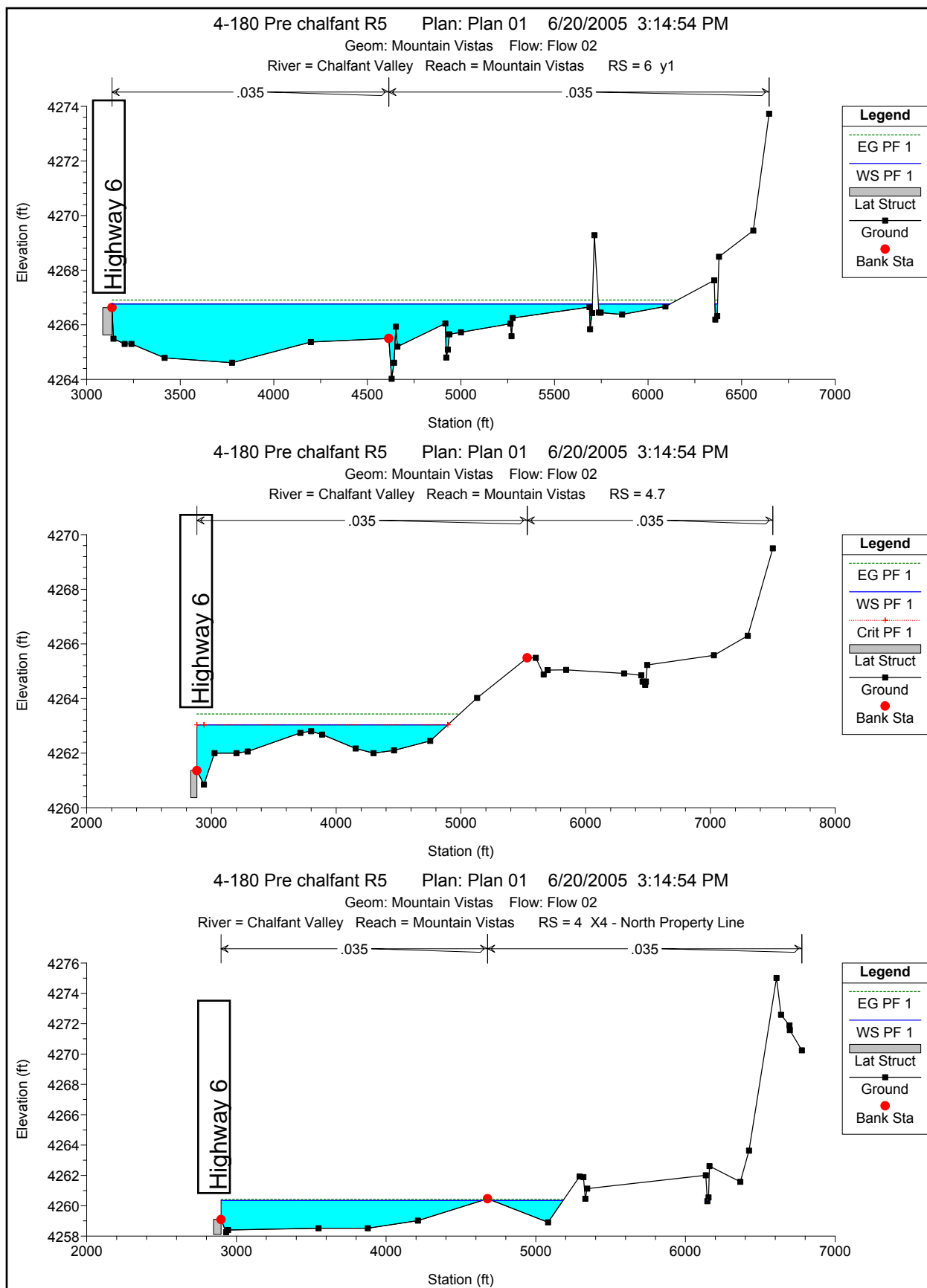
Chalfant Valley Mountain Vistas

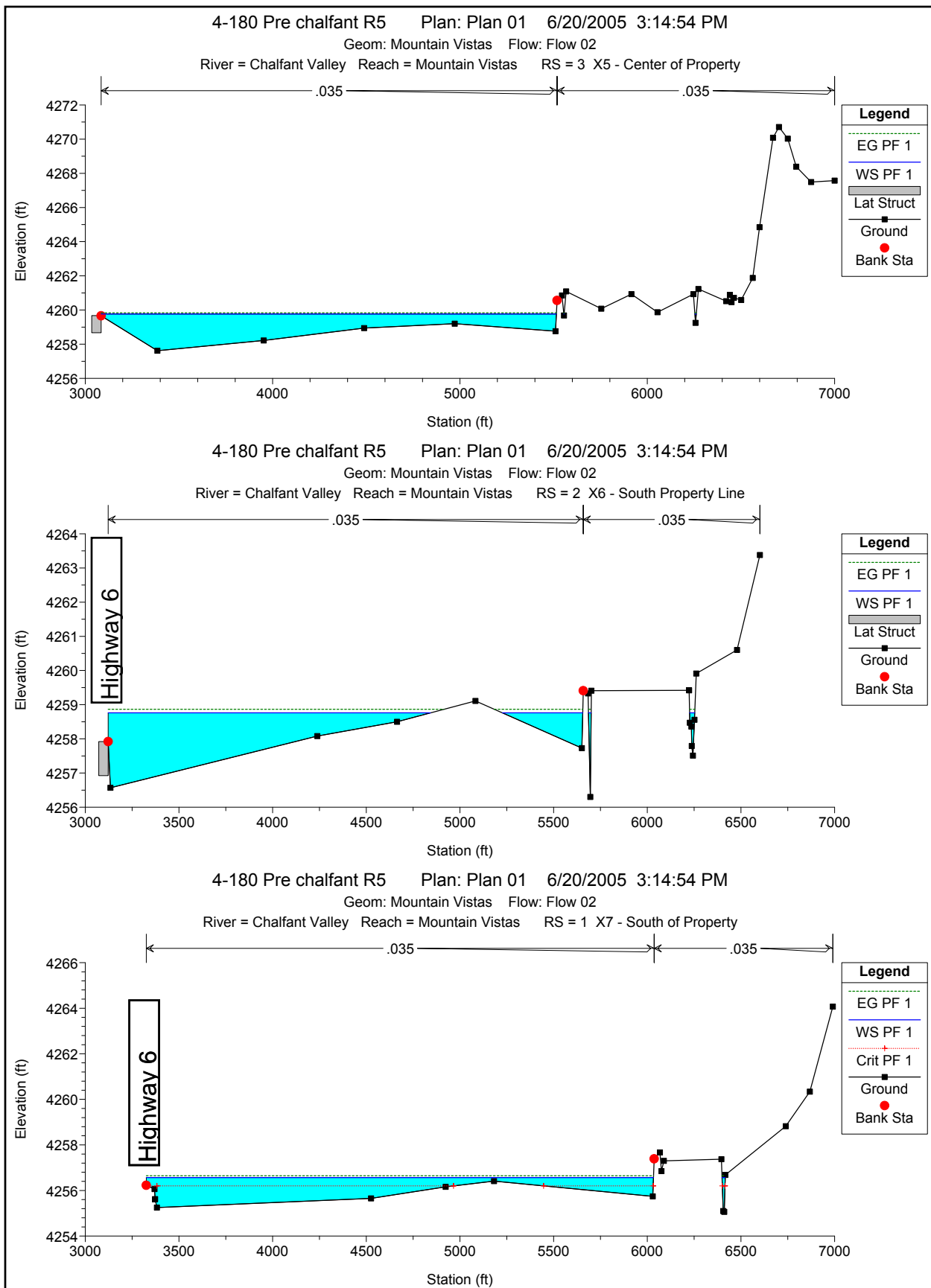
Legend	
EG PF 1	
WS PF 1	
Crit PF 1	
Ground	



1 in Horiz. = 1000 ft 1 in Vert. = 10 ft







HEC-RAS Plan: Plan 01 River: Chalfant Valley Reach: Mountain Vistas Profile: PF 1

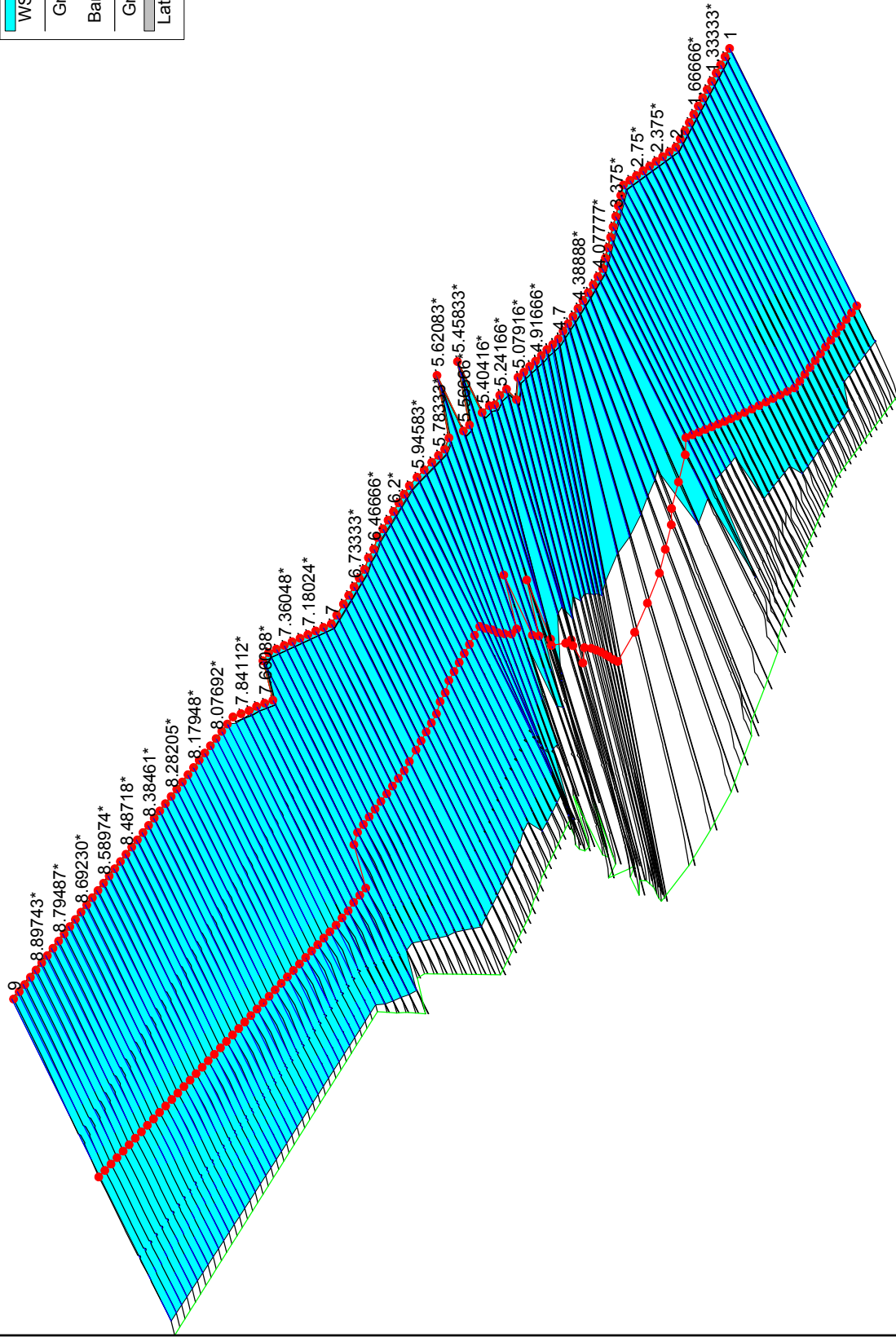
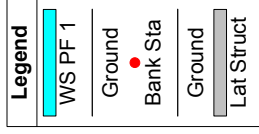
Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Mountain Vistas	9	PF 1	10000.00	4279.20	4282.06	4281.20	4282.28	0.003642	3.73	2723.73	1785.05	0.50
Mountain Vistas	8.97435*	PF 1	10000.00	4279.01	4281.89		4282.10	0.003690	3.72	2740.45	1831.35	0.50
Mountain Vistas	8.94871*	PF 1	10000.00	4278.82	4281.71		4281.92	0.003724	3.70	2759.97	1874.00	0.50
Mountain Vistas	8.92307*	PF 1	10000.00	4278.63	4281.53		4281.74	0.003763	3.68	2780.20	1922.89	0.50
Mountain Vistas	8.89743*	PF 1	10000.00	4278.44	4281.35		4281.55	0.003821	3.67	2794.55	1965.15	0.50
Mountain Vistas	8.87179*	PF 1	10000.00	4278.25	4281.16		4281.37	0.003875	3.65	2809.43	2008.19	0.50
Mountain Vistas	8.84615*	PF 1	10000.00	4278.06	4280.98		4281.18	0.003950	3.65	2817.06	2044.70	0.51
Mountain Vistas	8.82051*	PF 1	10000.00	4277.87	4280.78		4280.98	0.004046	3.65	2822.56	2143.06	0.51
Mountain Vistas	8.79487*	PF 1	10000.00	4277.68	4280.58		4280.79	0.004163	3.65	2838.98	2289.87	0.52
Mountain Vistas	8.76923*	PF 1	10000.00	4277.49	4280.38		4280.58	0.004252	3.66	2858.31	2394.94	0.52
Mountain Vistas	8.74358*	PF 1	10000.00	4277.29	4280.18		4280.38	0.004312	3.66	2882.21	2462.52	0.53
Mountain Vistas	8.71794*	PF 1	10000.00	4277.10	4279.97		4280.17	0.004378	3.65	2904.14	2502.39	0.53
Mountain Vistas	8.69230*	PF 1	10000.00	4276.91	4279.76		4279.95	0.004403	3.64	2929.54	2519.98	0.53
Mountain Vistas	8.66666*	PF 1	10000.00	4276.72	4279.55		4279.74	0.004400	3.61	2958.10	2543.43	0.53
Mountain Vistas	8.64102*	PF 1	10000.00	4276.53	4279.34		4279.52	0.004489	3.60	2971.48	2585.41	0.53
Mountain Vistas	8.61538*	PF 1	10000.00	4276.34	4279.12		4279.31	0.004512	3.58	2993.36	2615.75	0.53
Mountain Vistas	8.58974*	PF 1	10000.00	4276.15	4278.91		4279.09	0.004558	3.56	3008.46	2639.47	0.53
Mountain Vistas	8.56410*	PF 1	10000.00	4275.96	4278.69		4278.87	0.004596	3.53	3023.03	2658.98	0.53
Mountain Vistas	8.53846*	PF 1	10000.00	4275.77	4278.47		4278.64	0.004592	3.49	3038.88	2667.47	0.53
Mountain Vistas	8.51282*	PF 1	10000.00	4275.58	4278.25		4278.42	0.004630	3.45	3045.99	2678.14	0.53
Mountain Vistas	8.48718*	PF 1	10000.00	4275.39	4278.03		4278.20	0.004623	3.41	3056.55	2681.94	0.53
Mountain Vistas	8.46153*	PF 1	10000.00	4275.20	4277.80		4277.97	0.004663	3.38	3052.94	2679.46	0.53
Mountain Vistas	8.43589*	PF 1	10000.00	4275.01	4277.58		4277.75	0.004640	3.32	3062.51	2684.75	0.53
Mountain Vistas	8.41025*	PF 1	10000.00	4274.82	4277.36		4277.52	0.004674	3.28	3053.12	2676.74	0.53
Mountain Vistas	8.38461*	PF 1	10000.00	4274.63	4277.13		4277.30	0.004642	3.23	3056.10	2673.01	0.52
Mountain Vistas	8.35897*	PF 1	10000.00	4274.44	4276.91		4277.07	0.004632	3.18	3053.35	2676.93	0.52
Mountain Vistas	8.33333*	PF 1	10000.00	4274.25	4276.68		4276.85	0.004660	3.13	3037.66	2670.19	0.52
Mountain Vistas	8.30769*	PF 1	10000.00	4274.06	4276.45		4276.63	0.004624	3.07	3035.15	2673.13	0.52
Mountain Vistas	8.28205*	PF 1	10000.00	4273.87	4276.23		4276.40	0.004616	3.02	3022.73	2672.26	0.51
Mountain Vistas	8.25641*	PF 1	10000.00	4273.68	4275.99		4276.18	0.004637	2.97	3000.07	2667.22	0.51
Mountain Vistas	8.23076*	PF 1	10000.00	4273.48	4275.77		4275.96	0.004575	2.91	2996.22	2667.90	0.51
Mountain Vistas	8.20512*	PF 1	10000.00	4273.29	4275.54		4275.73	0.004583	2.86	2973.23	2663.63	0.51
Mountain Vistas	8.17948*	PF 1	10000.00	4273.10	4275.31		4275.51	0.004538	2.80	2961.30	2661.68	0.50
Mountain Vistas	8.15384*	PF 1	10000.00	4272.91	4275.08		4275.29	0.004538	2.74	2938.54	2662.70	0.50
Mountain Vistas	8.12820*	PF 1	10000.00	4272.72	4274.85		4275.07	0.004486	2.68	2925.62	2662.29	0.49
Mountain Vistas	8.10256*	PF 1	10000.00	4272.53	4274.62		4274.85	0.004512	2.64	2909.41	2664.86	0.49
Mountain Vistas	8.07692*	PF 1	10000.00	4272.34	4274.39		4274.63	0.004518	2.59	2875.66	2654.97	0.49
Mountain Vistas	8.05128*	PF 1	10000.00	4272.15	4274.15		4274.41	0.004509	2.54	2846.97	2648.18	0.49
Mountain Vistas	8.02564*	PF 1	10000.00	4271.96	4273.90		4274.18	0.004696	2.50	2758.87	2618.84	0.49
Mountain Vistas	8	PF 1	10000.00	4271.77	4273.65		4273.95	0.004748	2.51	2681.80	2514.56	0.50
Mountain Vistas	7.9		Lat Struct									
Mountain Vistas	7.84112*	PF 1	10000.00	4271.61	4273.42		4273.71	0.004793	2.47	2733.28	2665.49	0.50
Mountain Vistas	7.78104*	PF 1	10000.00	4271.45	4273.18		4273.46	0.004957	2.44	2771.04	2815.02	0.50
Mountain Vistas	7.72096*	PF 1	10000.00	4271.30	4272.94		4273.20	0.004984	2.48	2823.40	2873.07	0.50
Mountain Vistas	7.66088*	PF 1	9999.80	4271.14	4272.71		4272.95	0.004922	2.54	2889.75	2881.42	0.50
Mountain Vistas	7.60080*	PF 1	9998.84	4270.98	4272.48		4272.69	0.004949	2.63	2943.21	2870.43	0.51
Mountain Vistas	7.54072*	PF 1	9996.81	4270.77	4272.24		4272.44	0.004895	2.70	2996.41	2860.70	0.51
Mountain Vistas	7.48064*	PF 1	9993.50	4270.48	4272.01		4272.19	0.004880	2.79	3041.10	2857.11	0.51
Mountain Vistas	7.42056*	PF 1	9988.72	4270.19	4271.77		4271.95	0.004871	2.88	3080.40	2875.48	0.52
Mountain Vistas	7.36048*	PF 1	9982.31	4269.90	4271.54		4271.70	0.004805	2.97	3126.33	2894.79	0.52
Mountain Vistas	7.30040*	PF 1	9974.09	4269.62	4271.31		4271.46	0.004771	3.06	3158.20	2912.65	0.52
Mountain Vistas	7.24032*	PF 1	9963.85	4269.33	4271.07		4271.23	0.004648	3.14	3200.88	2967.29	0.52
Mountain Vistas	7.18024*	PF 1	9951.67	4269.04	4270.83		4270.99	0.004949	3.35	3212.32	3107.64	0.54
Mountain Vistas	7.12016*	PF 1	9937.96	4268.75	4270.58		4270.74	0.004875	3.44	3205.52	3126.02	0.54
Mountain Vistas	7.06008*	PF 1	9922.74	4268.47	4270.34		4270.50	0.004757	3.51	3197.88	3144.57	0.54
Mountain Vistas	7	PF 1	9905.15	4268.18	4270.11		4270.27	0.004287	3.49	3261.18	3163.66	0.52
Mountain Vistas	6.93333*	PF 1	9885.82	4267.94	4269.92		4270.07	0.003869	3.39	3355.24	3154.28	0.50
Mountain Vistas	6.86666*	PF 1	9862.41	4267.71	4269.62		4269.79	0.004628	3.61	3140.19	3129.35	0.54
Mountain Vistas	6.8*	PF 1	9846.35	4267.47	4269.39		4269.56	0.004624	3.63	3122.71	3109.08	0.54
Mountain Vistas	6.73333*	PF 1	9832.22	4267.24	4269.16		4269.33	0.004606	3.63	3109.44	3092.70	0.54
Mountain Vistas	6.66666*	PF 1	9819.97	4267.00	4268.92		4269.10	0.004617	3.65	3089.01	3078.35	0.54
Mountain Vistas	6.6*	PF 1	9809.56	4266.76	4268.69		4268.87	0.004628	3.67	3069.40	3064.23	0.54
Mountain Vistas	6.53333*	PF 1	9800.90	4266.53	4268.45		4268.64	0.004624	3.68	3052.97	3050.79	0.54
Mountain Vistas	6.46666*	PF 1	9793.84	4266.29	4268.22		4268.41	0.004605	3.69	3039.04	3036.71	0.54
Mountain Vistas	6.4*	PF 1	9788.32	4266.05	4267.99		4268.17	0.004640	3.71	3013.89	3022.42	0.54
Mountain Vistas	6.33333*	PF 1	9784.19	4265.81	4267.75		4267.94	0.004616	3.72	3001.88	3007.55	0.54
Mountain Vistas	6.26666*	PF 1	9781.23	4265.57	4267.52		4267.71	0.004574	3.72	2992.71	2990.42	0.54
Mountain Vistas	6.2*	PF 1	9779.14	4265.33	4267.30		4267.49	0.004435	3.69	3009.65	2978.85	0.53
Mountain Vistas	6.13333*	PF 1	9777.52	4265.09	4267.09		4267.27	0.004147	3.62	3064.11	2967.69	0.52
Mountain Vistas	6.06666*	PF 1	9775.68	4264.85	4266.91		4267.07	0.003597	3.46	3206.87	2961.11	0.48
Mountain Vistas	6	PF 1	9772.42	4264.61	4266.77		4266.91	0.002860	3.21	3456.80	2964.96	0.44
Mountain Vistas	5.94583*	PF 1	9766.06	4264.45	4266.64		4266.79	0.002950	3.25	3396.34	2989.87	0.44
Mountain Vistas	5.89166*	PF 1	9755.17	4264.30	4266.51		4266.66	0.003092	3.30	3306.23	2933.19	0.45
Mountain Vistas	5.8375*	PF 1	9739.76	4264.14	4266.35		4266.52	0.003354	3.38	3175.99	2837.92	0.47
Mountain Vistas	5.78333*	PF 1	9720.70	4263.98	4266.18		4266.36	0.003831	3.51	2994.39	2532.73	0.50
Mountain Vistas	5.72916*	PF 1	9700.83	4263.83	4265.93		4266.15	0.005344	3.87	2648.47	2384.56	0.58
Mountain Vistas	5.675*	PF 1	9678.97	4263.64	4265.78		4265.94	0.003187	3.31	3035.92	2417.54	0.46
Mountain Vistas	5.62083*	PF 1	9650.05	4263.15	4265.67		4265.81	0.002355	2.99	3303.25	2353.87	0.40

HEC-RAS Plan: Plan 01 River: Chalfant Valley Reach: Mountain Vistas Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Mountain Vistas	5.56666*	PF 1	9613.65	4263.36	4265.51		4265.68	0.003147	3.23	3011.90	2187.92	0.45
Mountain Vistas	5.5125*	PF 1	9571.34	4263.20	4265.35		4265.52	0.003296	3.28	2929.58	2010.98	0.46
Mountain Vistas	5.45833*	PF 1	9522.64	4263.02	4265.21		4265.37	0.003092	3.22	2964.69	1892.70	0.45
Mountain Vistas	5.40416*	PF 1	9466.81	4262.89	4265.06		4265.22	0.003157	3.23	2930.72	1881.19	0.45
Mountain Vistas	5.35*	PF 1	9402.75	4262.73	4264.93		4265.07	0.002726	3.08	3053.36	1873.33	0.42
Mountain Vistas	5.29583*	PF 1	9331.19	4262.65	4264.75		4264.92	0.003573	3.33	2799.31	1858.29	0.48
Mountain Vistas	5.24166*	PF 1	9252.12	4262.42	4264.61		4264.76	0.002840	3.09	2991.34	1870.25	0.43
Mountain Vistas	5.1875*	PF 1	9162.28	4262.26	4264.50		4264.63	0.002467	2.94	3116.59	1891.82	0.40
Mountain Vistas	5.13333*	PF 1	9067.50	4262.37	4264.24		4264.46	0.005406	3.72	2439.14	1875.73	0.57
Mountain Vistas	5.07916*	PF 1	8971.63	4261.95	4264.02		4264.21	0.004479	3.50	2562.27	1871.79	0.53
Mountain Vistas	5.025*	PF 1	8865.24	4261.79	4263.94		4264.05	0.001961	2.67	3314.35	1951.57	0.36
Mountain Vistas	4.97083*	PF 1	8743.43	4261.63	4263.82		4263.95	0.002389	2.83	3084.53	1930.61	0.40
Mountain Vistas	4.91666*	PF 1	8606.81	4261.48	4263.72		4263.84	0.002167	2.72	3164.59	1959.12	0.38
Mountain Vistas	4.8625*	PF 1	8451.52	4261.32	4263.66		4263.75	0.001356	2.33	3632.35	1999.40	0.30
Mountain Vistas	4.80833*	PF 1	8278.12	4261.16	4263.55		4263.66	0.002195	2.65	3121.83	2026.35	0.38
Mountain Vistas	4.75416*	PF 1	8084.13	4261.01	4263.52		4263.58	0.000895	1.99	4065.91	2073.40	0.25
Mountain Vistas	4.7	PF 1	7899.73	4260.85	4263.04	4263.04	4263.44	0.019794	5.05	1564.47	2011.04	1.01
Mountain Vistas	4.62222*	PF 1	7752.41	4260.56	4262.40	4261.90	4262.56	0.004294	3.24	2389.56	1896.19	0.51
Mountain Vistas	4.54444*	PF 1	7609.89	4260.27	4262.20		4262.36	0.004144	3.20	2378.87	1876.99	0.50
Mountain Vistas	4.46666*	PF 1	7459.16	4259.98	4261.87		4262.10	0.007578	3.85	1939.40	1825.31	0.66
Mountain Vistas	4.38888*	PF 1	7307.57	4259.69	4261.52		4261.75	0.007142	3.79	1928.92	1776.32	0.64
Mountain Vistas	4.31111*	PF 1	7151.04	4259.41	4261.23		4261.43	0.006076	3.61	1982.71	1741.05	0.60
Mountain Vistas	4.23333*	PF 1	6987.58	4259.12	4260.91		4261.12	0.006890	3.74	1866.36	1702.79	0.63
Mountain Vistas	4.15555*	PF 1	6814.67	4258.83	4260.61		4260.81	0.006188	3.61	1905.20	1812.47	0.60
Mountain Vistas	4.07777*	PF 1	6635.72	4258.54	4260.43		4260.56	0.003441	2.95	2317.14	2005.91	0.46
Mountain Vistas	4	PF 1	6480.19	4258.25	4260.35		4260.43	0.001654	2.27	2982.23	2221.26	0.33
Mountain Vistas	3.875*	PF 1	6361.31	4258.17	4260.28		4260.36	0.001697	2.24	2945.51	2278.35	0.33
Mountain Vistas	3.75*	PF 1	6257.57	4258.09	4260.21		4260.29	0.001711	2.21	2913.60	2283.11	0.33
Mountain Vistas	3.625*	PF 1	6168.49	4258.01	4260.14		4260.21	0.001722	2.18	2891.02	2295.01	0.33
Mountain Vistas	3.5*	PF 1	6093.40	4257.94	4260.07		4260.14	0.001744	2.15	2869.70	2307.89	0.33
Mountain Vistas	3.375*	PF 1	6031.56	4257.86	4260.00		4260.07	0.001782	2.13	2850.65	2321.16	0.33
Mountain Vistas	3.25*	PF 1	5982.28	4257.78	4259.93		4259.99	0.001850	2.12	2829.67	2317.52	0.33
Mountain Vistas	3.125*	PF 1	5944.73	4257.70	4259.85		4259.92	0.001943	2.11	2816.26	2355.94	0.34
Mountain Vistas	3	PF 1	5918.03	4257.62	4259.76		4259.83	0.002123	2.13	2773.33	2439.00	0.35
Mountain Vistas	2.875*	PF 1	5893.61	4257.49	4259.66		4259.73	0.002160	2.14	2757.54	2449.84	0.35
Mountain Vistas	2.75*	PF 1	5860.21	4257.36	4259.56		4259.63	0.002192	2.14	2741.27	2461.02	0.36
Mountain Vistas	2.625*	PF 1	5816.48	4257.23	4259.46		4259.53	0.002283	2.15	2701.75	2476.33	0.36
Mountain Vistas	2.5*	PF 1	5761.83	4257.09	4259.35		4259.42	0.002375	2.17	2663.80	2505.93	0.37
Mountain Vistas	2.375*	PF 1	5695.92	4256.96	4259.23		4259.31	0.002591	2.21	2588.27	2535.78	0.38
Mountain Vistas	2.25*	PF 1	5618.99	4256.83	4259.10		4259.18	0.002934	2.28	2469.25	2518.53	0.40
Mountain Vistas	2.125*	PF 1	5532.25	4256.70	4258.95		4259.04	0.003276	2.40	2306.80	2356.83	0.43
Mountain Vistas	2	PF 1	5438.97	4256.57	4258.76		4258.87	0.004051	2.61	2081.71	2190.89	0.47
Mountain Vistas	1.91666*	PF 1	5347.31	4256.46	4258.58		4258.68	0.004040	2.58	2077.09	2232.70	0.47
Mountain Vistas	1.83333*	PF 1	5260.07	4256.35	4258.40		4258.50	0.004049	2.54	2073.12	2284.56	0.47
Mountain Vistas	1.75*	PF 1	5177.52	4256.24	4258.22		4258.32	0.004038	2.50	2073.06	2330.32	0.47
Mountain Vistas	1.66666*	PF 1	5099.53	4256.13	4258.05		4258.14	0.004038	2.45	2086.27	2429.97	0.46
Mountain Vistas	1.58333*	PF 1	5025.88	4256.02	4257.87		4257.96	0.004125	2.40	2095.05	2548.99	0.47
Mountain Vistas	1.5*	PF 1	4956.55	4255.91	4257.68		4257.77	0.004264	2.38	2089.20	2643.01	0.47
Mountain Vistas	1.41666*	PF 1	4891.45	4255.80	4257.49		4257.58	0.004246	2.36	2080.07	2657.54	0.47
Mountain Vistas	1.33333*	PF 1	4830.43	4255.69	4257.30		4257.39	0.004214	2.33	2073.73	2671.48	0.47
Mountain Vistas	1.25*	PF 1	4773.42	4255.58	4257.12		4257.20	0.004207	2.31	2064.23	2684.74	0.46
Mountain Vistas	1.16666*	PF 1	4720.30	4255.47	4256.93		4257.01	0.004159	2.29	2061.62	2697.16	0.46
Mountain Vistas	1.08333*	PF 1	4670.85	4255.36	4256.75		4256.83	0.004093	2.26	2062.79	2709.48	0.46
Mountain Vistas	1	PF 1	4653.34	4255.25	4256.57	4256.20	4256.64	0.003997	2.24	2077.19	2724.50	0.45

4-180 Pre chalfant R5 Plan: Plan 01 6/20/2005 3:14:54 PM

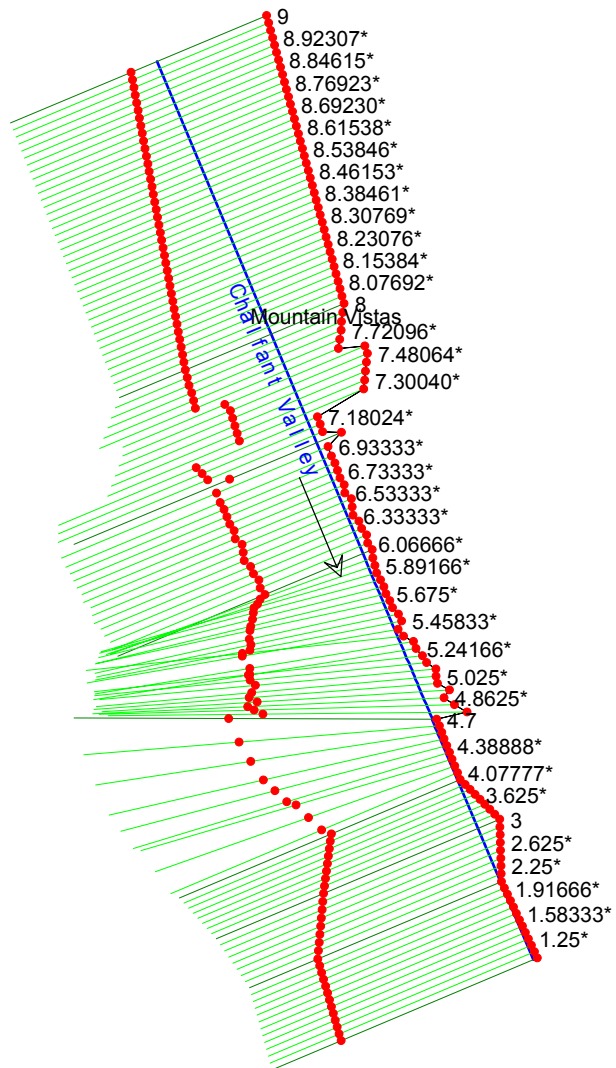
Geom: Mountain Vistas Flow: Flow 02

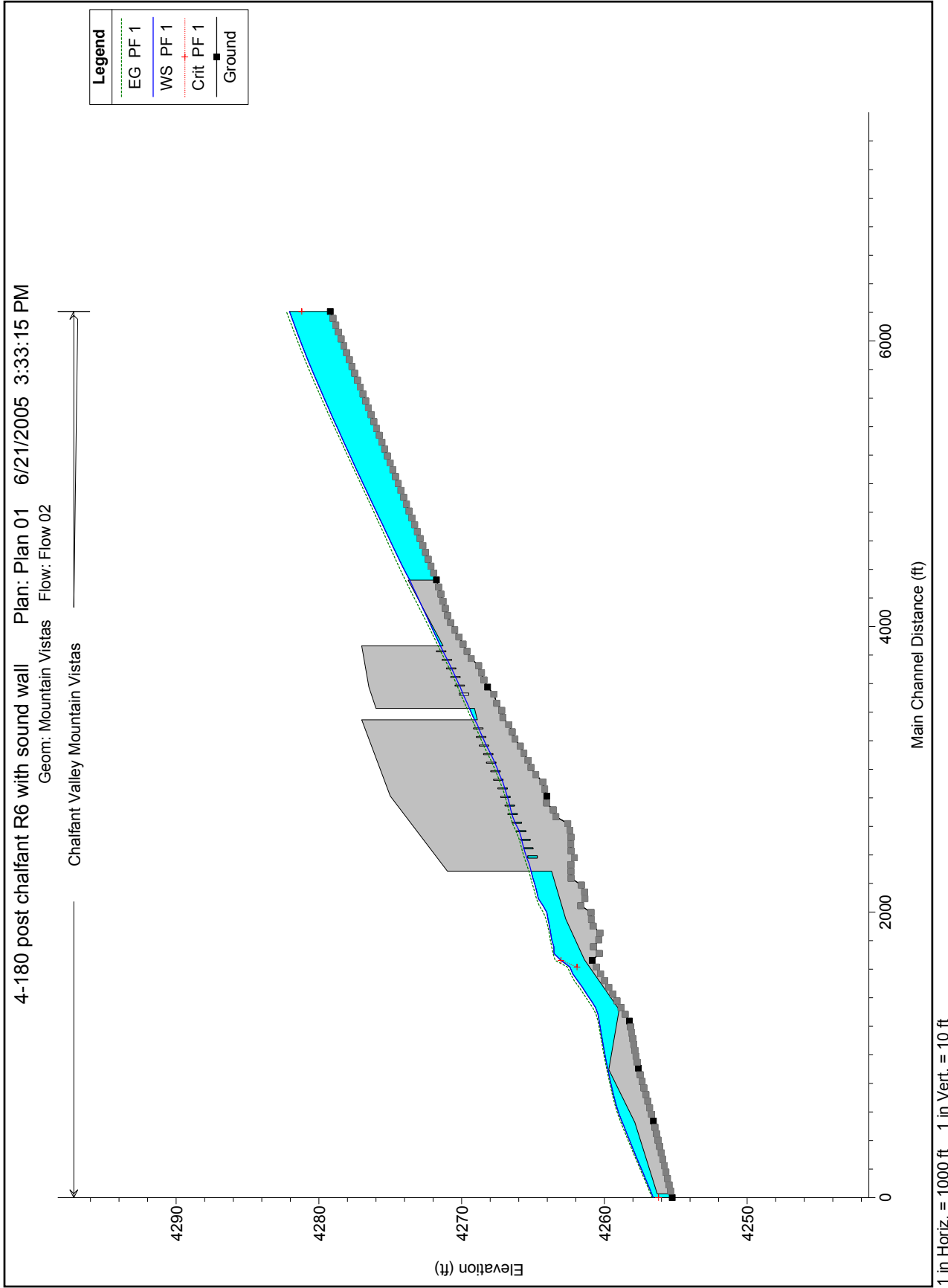


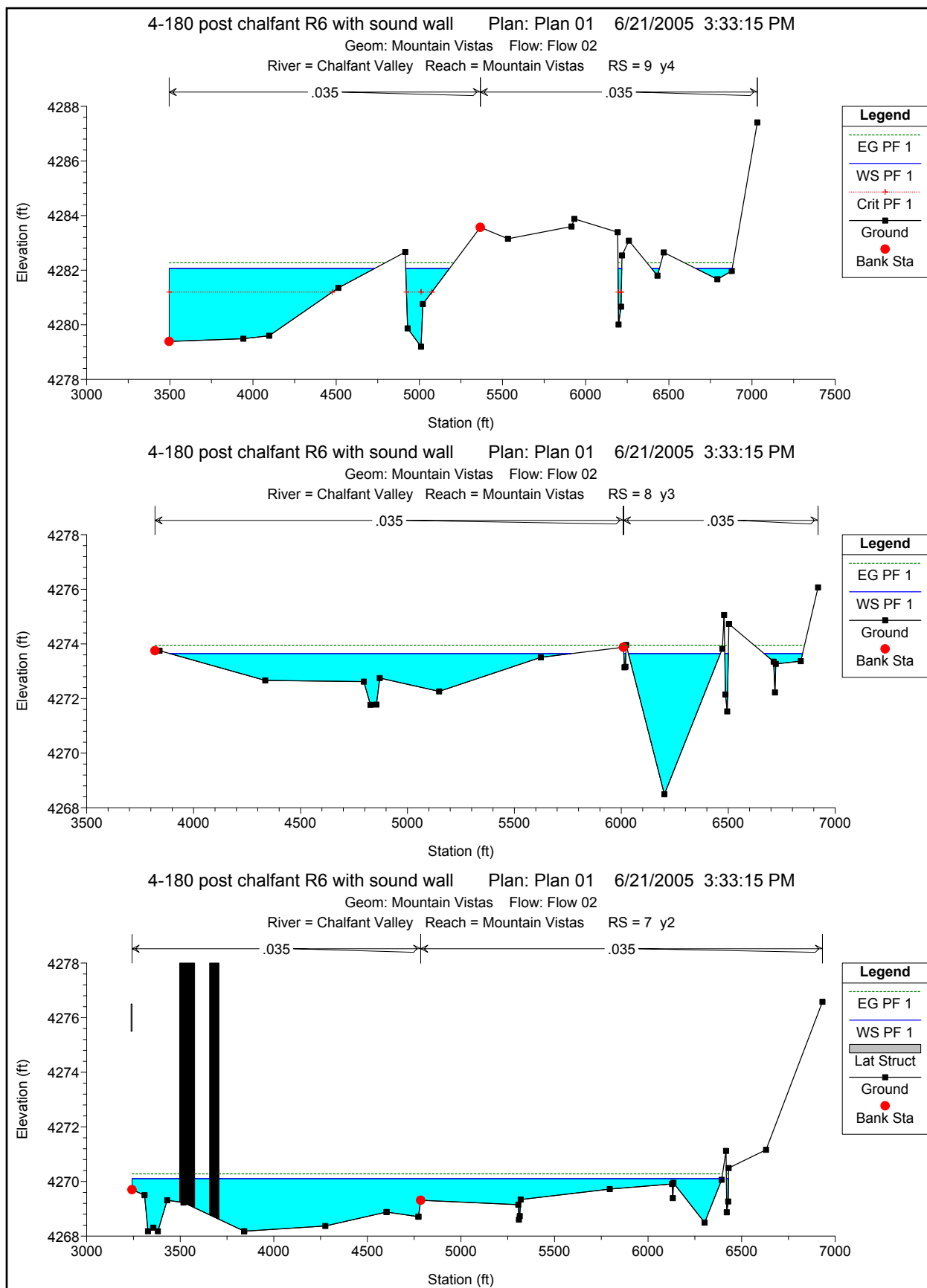


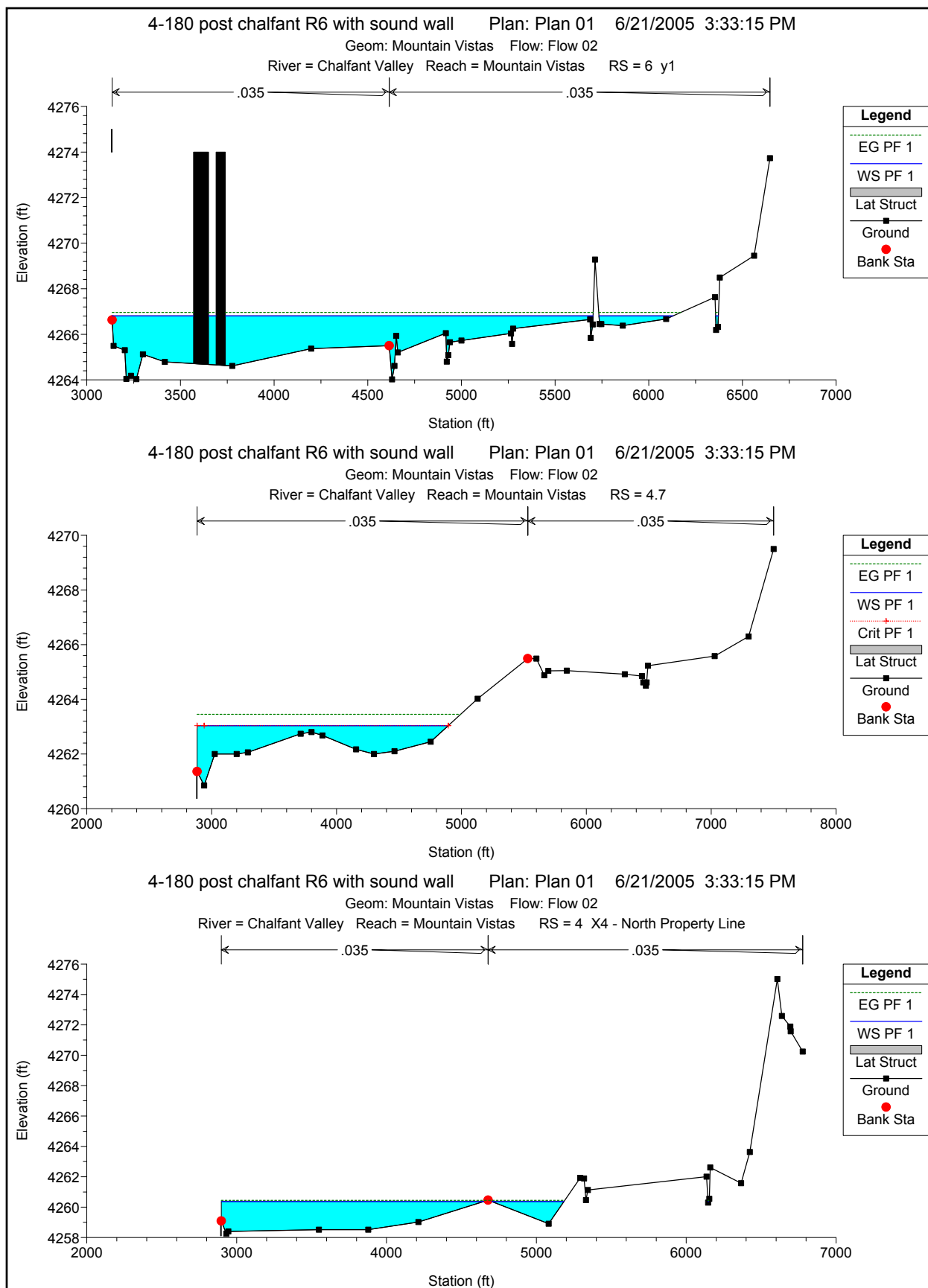
Preliminary Base Flood Elevation Study
Mountain Vistas

Appendix D
Hydraulic Calculations
Proposed Conditions









HEC-RAS Plan: Plan 01 River: Chalfant Valley Reach: Mountain Vistas Profile: PF 1



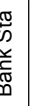
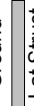

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Mountain Vistas	9	PF 1	10000.00	4279.20	4282.06	4281.20	4282.28	0.003642	3.73	2723.73	1785.05	0.50
Mountain Vistas	8.97435*	PF 1	10000.00	4279.01	4281.89		4282.10	0.003690	3.72	2740.45	1831.35	0.50
Mountain Vistas	8.94871*	PF 1	10000.00	4278.82	4281.71		4281.92	0.003724	3.70	2759.97	1874.00	0.50
Mountain Vistas	8.92307*	PF 1	10000.00	4278.63	4281.53		4281.74	0.003763	3.68	2780.20	1922.89	0.50
Mountain Vistas	8.89743*	PF 1	10000.00	4278.44	4281.35		4281.55	0.003821	3.67	2794.55	1965.15	0.50
Mountain Vistas	8.87179*	PF 1	10000.00	4278.25	4281.16		4281.37	0.003875	3.65	2809.43	2008.19	0.50
Mountain Vistas	8.84615*	PF 1	10000.00	4278.06	4280.98		4281.18	0.003950	3.65	2817.06	2044.70	0.51
Mountain Vistas	8.82051*	PF 1	10000.00	4277.87	4280.78		4280.98	0.004046	3.65	2822.56	2143.06	0.51
Mountain Vistas	8.79487*	PF 1	10000.00	4277.68	4280.58		4280.79	0.004163	3.65	2838.98	2289.87	0.52
Mountain Vistas	8.76923*	PF 1	10000.00	4277.49	4280.38		4280.58	0.004252	3.66	2858.31	2394.94	0.52
Mountain Vistas	8.74358*	PF 1	10000.00	4277.29	4280.18		4280.38	0.004312	3.66	2882.21	2462.52	0.53
Mountain Vistas	8.71794*	PF 1	10000.00	4277.10	4279.97		4280.17	0.004378	3.65	2904.14	2502.39	0.53
Mountain Vistas	8.69230*	PF 1	10000.00	4276.91	4279.76		4279.95	0.004403	3.64	2929.54	2519.98	0.53
Mountain Vistas	8.66666*	PF 1	10000.00	4276.72	4279.55		4279.74	0.004400	3.61	2958.10	2543.43	0.53
Mountain Vistas	8.64102*	PF 1	10000.00	4276.53	4279.34		4279.52	0.004489	3.60	2971.48	2585.41	0.53
Mountain Vistas	8.61538*	PF 1	10000.00	4276.34	4279.12		4279.31	0.004512	3.58	2993.36	2615.75	0.53
Mountain Vistas	8.58974*	PF 1	10000.00	4276.15	4278.91		4279.09	0.004558	3.56	3008.46	2639.47	0.53
Mountain Vistas	8.56410*	PF 1	10000.00	4275.96	4278.69		4278.87	0.004596	3.53	3023.03	2658.98	0.53
Mountain Vistas	8.53846*	PF 1	10000.00	4275.77	4278.47		4278.64	0.004592	3.49	3038.88	2667.47	0.53
Mountain Vistas	8.51282*	PF 1	10000.00	4275.58	4278.25		4278.42	0.004630	3.45	3045.99	2678.14	0.53
Mountain Vistas	8.48718*	PF 1	10000.00	4275.39	4278.03		4278.20	0.004623	3.41	3056.55	2681.94	0.53
Mountain Vistas	8.46153*	PF 1	10000.00	4275.20	4277.80		4277.97	0.004663	3.38	3052.94	2679.46	0.53
Mountain Vistas	8.43589*	PF 1	10000.00	4275.01	4277.58		4277.75	0.004640	3.32	3062.51	2684.75	0.53
Mountain Vistas	8.41025*	PF 1	10000.00	4274.82	4277.36		4277.52	0.004674	3.28	3053.12	2676.74	0.53
Mountain Vistas	8.38461*	PF 1	10000.00	4274.63	4277.13		4277.30	0.004642	3.23	3056.10	2673.01	0.52
Mountain Vistas	8.35897*	PF 1	10000.00	4274.44	4276.91		4277.07	0.004632	3.18	3053.35	2676.93	0.52
Mountain Vistas	8.33333*	PF 1	10000.00	4274.25	4276.68		4276.85	0.004660	3.13	3037.66	2670.19	0.52
Mountain Vistas	8.30769*	PF 1	10000.00	4274.06	4276.45		4276.63	0.004624	3.07	3035.15	2673.13	0.52
Mountain Vistas	8.28205*	PF 1	10000.00	4273.87	4276.23		4276.40	0.004616	3.02	3022.73	2672.26	0.51
Mountain Vistas	8.25641*	PF 1	10000.00	4273.68	4275.99		4276.18	0.004637	2.97	3000.07	2667.22	0.51
Mountain Vistas	8.23076*	PF 1	10000.00	4273.48	4275.77		4275.96	0.004575	2.91	2996.22	2667.90	0.51
Mountain Vistas	8.20512*	PF 1	10000.00	4273.29	4275.54		4275.73	0.004583	2.86	2973.23	2663.63	0.51
Mountain Vistas	8.17948*	PF 1	10000.00	4273.10	4275.31		4275.51	0.004538	2.80	2961.30	2661.68	0.50
Mountain Vistas	8.15384*	PF 1	10000.00	4272.91	4275.08		4275.29	0.004538	2.74	2938.54	2662.70	0.50
Mountain Vistas	8.12820*	PF 1	10000.00	4272.72	4274.85		4275.07	0.004486	2.68	2925.62	2662.29	0.49
Mountain Vistas	8.10256*	PF 1	10000.00	4272.53	4274.62		4274.85	0.004512	2.64	2909.41	2664.86	0.49
Mountain Vistas	8.07692*	PF 1	10000.00	4272.34	4274.39		4274.63	0.004518	2.59	2875.66	2654.97	0.49
Mountain Vistas	8.05128*	PF 1	10000.00	4272.15	4274.15		4274.41	0.004509	2.54	2846.97	2648.18	0.49
Mountain Vistas	8.02564*	PF 1	10000.00	4271.96	4273.90		4274.18	0.004696	2.50	2758.87	2618.84	0.49
Mountain Vistas	8	PF 1	10000.00	4271.77	4273.65		4273.95	0.004748	2.51	2681.80	2514.56	0.50
Mountain Vistas	7.9		Lat Struct									
Mountain Vistas	7.84112*	PF 1	10000.00	4271.61	4273.42		4273.71	0.004793	2.47	2733.28	2665.49	0.50
Mountain Vistas	7.78104*	PF 1	10000.00	4271.45	4273.18		4273.46	0.004953	2.44	2772.42	2816.24	0.50
Mountain Vistas	7.72096*	PF 1	10000.00	4271.30	4272.94		4273.20	0.004966	2.47	2827.61	2873.93	0.50
Mountain Vistas	7.66088*	PF 1	9999.94	4271.14	4272.72		4272.95	0.004879	2.54	2899.60	2884.36	0.50
Mountain Vistas	7.60080*	PF 1	9999.43	4270.98	4272.48		4272.69	0.004943	2.63	2944.61	2870.75	0.51
Mountain Vistas	7.54072*	PF 1	9998.15	4270.77	4272.25		4272.44	0.004876	2.70	3000.60	2861.63	0.51
Mountain Vistas	7.48064*	PF 1	9995.85	4270.48	4272.01		4272.20	0.004828	2.78	3052.26	2858.08	0.51
Mountain Vistas	7.42056*	PF 1	9992.29	4270.19	4271.78		4271.95	0.004752	2.86	3105.69	2877.71	0.51
Mountain Vistas	7.36048*	PF 1	9987.43	4269.90	4271.54		4271.71	0.004887	3.02	3078.26	2815.96	0.53
Mountain Vistas	7.30040*	PF 1	9984.84	4269.62	4271.30		4271.46	0.004968	3.16	3079.30	2811.27	0.53
Mountain Vistas	7.24032*	PF 1	9984.84	4269.33	4271.04		4271.21	0.005330	3.30	3051.13	2870.72	0.55
Mountain Vistas	7.18024*	PF 1	9982.59	4268.81	4270.80		4270.96	0.004593	3.35	3182.43	3023.69	0.53
Mountain Vistas	7.12016*	PF 1	9980.24	4268.61	4270.56		4270.72	0.004759	3.53	3181.00	3045.25	0.54
Mountain Vistas	7.06008*	PF 1	9977.65	4268.43	4270.34		4270.49	0.004227	3.42	3309.72	3144.60	0.51
Mountain Vistas	7	PF 1	9974.67	4268.18	4270.10		4270.28	0.004298	3.63	3193.09	3033.46	0.52
Mountain Vistas	6.93333*	PF 1	9967.60	4267.74	4269.90		4270.07	0.004121	3.59	3228.94	3023.77	0.51
Mountain Vistas	6.86666*	PF 1	9967.60	4267.54	4269.61		4269.79	0.004529	3.67	3140.40	3077.45	0.54
Mountain Vistas	6.8*	PF 1	9963.64	4267.19	4269.39		4269.57	0.004344	3.63	3167.85	3059.43	0.53
Mountain Vistas	6.73333*	PF 1	9953.05	4267.11	4269.17		4269.35	0.004246	3.64	3163.56	3015.06	0.52
Mountain Vistas	6.66666*	PF 1	9950.85	4266.70	4268.90		4269.11	0.005235	3.98	2906.50	2915.68	0.58
Mountain Vistas	6.6*	PF 1	9948.58	4266.46	4268.70		4268.87	0.004007	3.55	3220.91	3065.89	0.51
Mountain Vistas	6.53333*	PF 1	9946.87	4266.27	4268.47		4268.66	0.004443	3.73	3076.37	2973.07	0.53
Mountain Vistas	6.46666*	PF 1	9945.85	4265.89	4268.25		4268.44	0.004412	3.75	3061.98	2940.28	0.53
Mountain Vistas	6.4*	PF 1	9945.85	4265.64	4267.99		4268.20	0.005098	3.97	2892.80	2892.35	0.57
Mountain Vistas	6.33333*	PF 1	9944.92	4265.35	4267.75		4267.95	0.004584	3.82	2986.96	2927.62	0.54
Mountain Vistas	6.26666*	PF 1	9944.53	4265.14	4267.53		4267.73	0.004478	3.77	3014.07	2942.95	0.54
Mountain Vistas	6.2*	PF 1	9943.77	4264.81	4267.35		4267.52	0.003539	3.47	3265.39	2992.73	0.48
Mountain Vistas	6.13333*	PF 1	9943.38	4264.31	4267.11		4267.32	0.004429	3.86	2962.43	2812.90	0.54
Mountain Vistas	6.06666*	PF 1	9942.34	4264.18	4266.96		4267.12	0.003222	3.43	3316.57	2892.47	0.46
Mountain Vistas	6	PF 1	9942.34	4264.03	4266.81		4266.96	0.002993	3.36	3394.56	2847.40	0.45
Mountain Vistas	5.94583*	PF 1	9941.08	4264.05	4266.67		4266.83	0.003258	3.46	3280.54	2868.59	0.47
Mountain Vistas	5.89166*	PF 1	9938.32	4263.58	4266.56		4266.70	0.002818	3.26	3435.54	2959.25	0.43
Mountain Vistas	5.8375*	PF 1	9934.99	4263.40	4266.43		4266.58	0.002946	3.30	3350.68	2881.56	0.44
Mountain Vistas	5.78333*	PF 1	9930.54	4262.57	4266.24		4266.43	0.003810	3.64	2984.04	2581.86	0.50
Mountain Vistas	5.72916*	PF 1	9930.54	4262.42	4265.99		4266.23	0.005247	4.00	2641.97	2246.44	0.58
Mountain Vistas	5.675*	PF 1	9925.86	4262.33	4265.84		4266.02	0.003301	3.48	2989.94	2280.10	0.47
Mountain Vistas	5.62083*	PF 1	9919.11	4262.36	4265.72		4265.88	0.002473	3.16	3236.44	2298.58	0.41

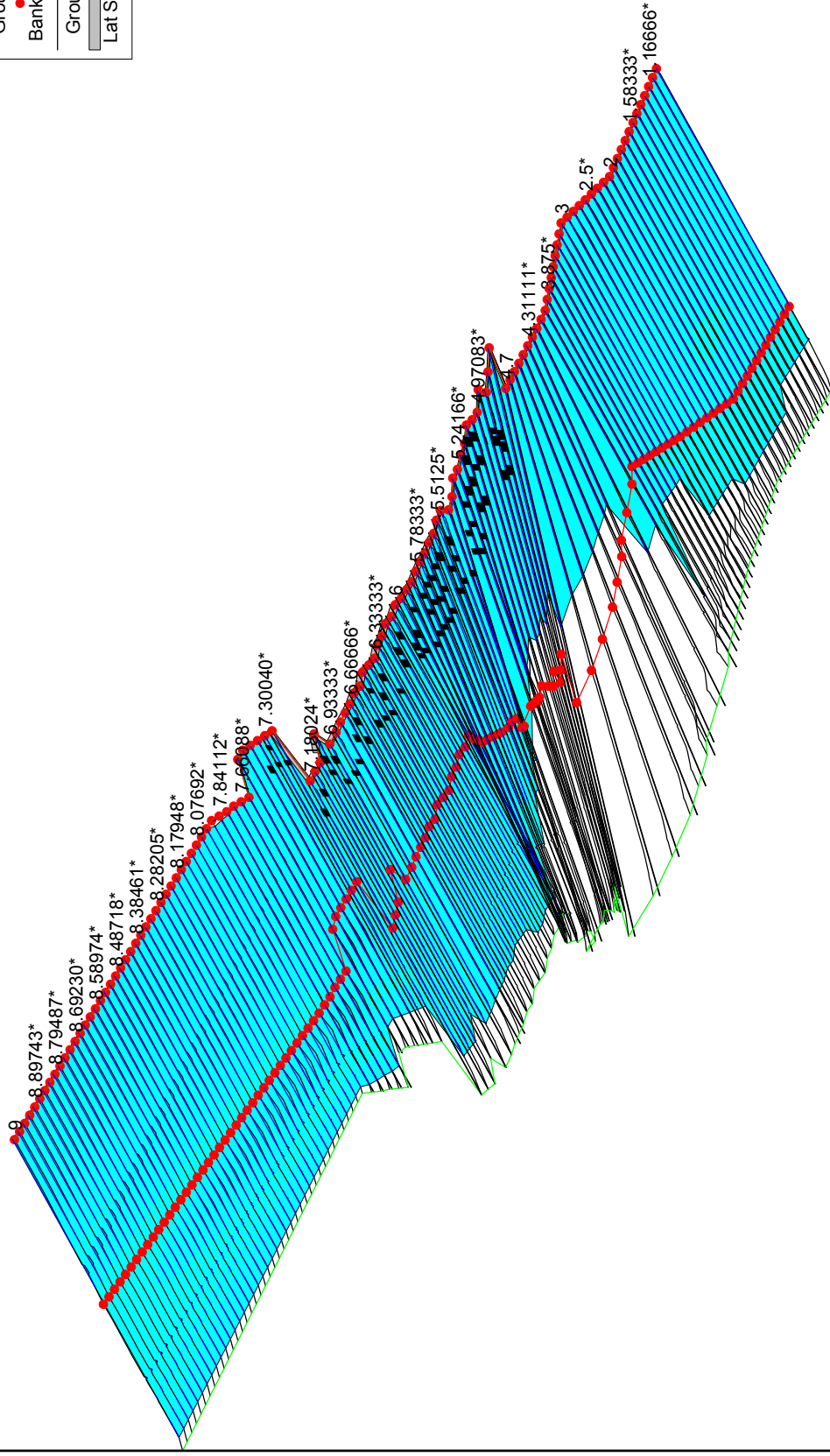
HEC-RAS Plan: Plan 01 River: Chalfant Valley Reach: Mountain Vistas Profile: PF 1 (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Mountain Vistas	5.56666*	PF 1	9911.62	4262.33	4265.59		4265.75	0.002876	3.24	3122.85	2246.72	0.44
Mountain Vistas	5.5125*	PF 1	9891.32	4262.10	4265.45		4265.61	0.002959	3.26	3063.38	2036.57	0.44
Mountain Vistas	5.45833*	PF 1	9891.32	4262.34	4265.25		4265.45	0.003713	3.57	2777.34	1740.48	0.49
Mountain Vistas	5.40416*	PF 1	9887.65	4262.34	4265.13		4265.28	0.002704	3.12	3171.83	1914.37	0.42
Mountain Vistas	5.35*	PF 1	9761.13	4262.33	4265.01		4265.16	0.002526	3.07	3184.97	1863.56	0.41
Mountain Vistas	5.29583*	PF 1	9632.79	4261.61	4264.86		4265.02	0.002977	3.23	2978.92	1799.39	0.44
Mountain Vistas	5.24166*	PF 1	9502.92	4261.38	4264.73		4264.89	0.002699	3.15	3020.74	1758.86	0.42
Mountain Vistas	5.1875*	PF 1	9369.44	4261.37	4264.62		4264.76	0.002315	2.96	3162.34	1799.94	0.39
Mountain Vistas	5.13333*	PF 1	9243.83	4261.66	4264.30		4264.57	0.006729	4.20	2201.43	1651.00	0.64
Mountain Vistas	5.07916*	PF 1	9132.80	4260.93	4264.04		4264.27	0.005356	3.89	2348.31	1665.73	0.58
Mountain Vistas	5.025*	PF 1	9022.53	4260.91	4263.95		4264.08	0.002297	2.92	3092.87	1792.50	0.39
Mountain Vistas	4.97083*	PF 1	8900.08	4260.78	4263.85		4263.97	0.002157	2.76	3219.36	1937.66	0.38
Mountain Vistas	4.91666*	PF 1	8760.23	4260.31	4263.77		4263.87	0.001773	2.57	3405.50	1971.04	0.34
Mountain Vistas	4.8625*	PF 1	8601.67	4260.39	4263.69		4263.79	0.001497	2.51	3424.38	1797.30	0.32
Mountain Vistas	4.80833*	PF 1	8429.07	4260.77	4263.55		4263.69	0.002909	3.05	2763.56	1784.55	0.43
Mountain Vistas	4.75416*	PF 1	8237.18	4260.35	4263.54		4263.60	0.000842	1.97	4189.52	2076.71	0.24
Mountain Vistas	4.7	PF 1	8053.01	4260.85	4263.04	4263.04	4263.45	0.020569	5.15	1564.47	2011.04	1.03
Mountain Vistas	4.62222*	PF 1	7905.69	4260.56	4262.41	4261.91	4262.58	0.004297	3.27	2419.22	1900.00	0.51
Mountain Vistas	4.54444*	PF 1	7763.16	4260.27	4262.22		4262.38	0.004151	3.22	2408.23	1880.89	0.50
Mountain Vistas	4.46666*	PF 1	7612.43	4259.98	4261.88		4262.11	0.007561	3.87	1966.17	1829.07	0.66
Mountain Vistas	4.38888*	PF 1	7460.84	4259.69	4261.54		4261.76	0.007120	3.81	1956.71	1780.45	0.64
Mountain Vistas	4.31111*	PF 1	7304.32	4259.41	4261.24		4261.45	0.006069	3.63	2010.80	1745.41	0.60
Mountain Vistas	4.23333*	PF 1	7140.85	4259.12	4260.92		4261.14	0.006878	3.77	1893.83	1707.33	0.63
Mountain Vistas	4.15555*	PF 1	6967.95	4258.83	4260.62		4260.83	0.006140	3.63	1939.85	1826.30	0.60
Mountain Vistas	4.07777*	PF 1	6788.99	4258.54	4260.45		4260.59	0.003427	2.97	2358.43	2020.82	0.46
Mountain Vistas	4	PF 1	6633.46	4258.25	4260.37		4260.45	0.001662	2.30	3026.84	2235.08	0.33
Mountain Vistas	3.875*	PF 1	6514.59	4258.17	4260.30		4260.38	0.001700	2.26	2990.12	2289.34	0.33
Mountain Vistas	3.75*	PF 1	6410.84	4258.09	4260.23		4260.31	0.001715	2.23	2957.16	2291.25	0.33
Mountain Vistas	3.625*	PF 1	6321.77	4258.01	4260.16		4260.23	0.001725	2.20	2934.79	2302.36	0.33
Mountain Vistas	3.5*	PF 1	6246.68	4257.94	4260.09		4260.16	0.001749	2.17	2912.59	2314.75	0.33
Mountain Vistas	3.375*	PF 1	6184.84	4257.86	4260.02		4260.09	0.001786	2.15	2893.78	2327.84	0.33
Mountain Vistas	3.25*	PF 1	6135.56	4257.78	4259.94		4260.01	0.001854	2.14	2871.65	2329.58	0.34
Mountain Vistas	3.125*	PF 1	6098.01	4257.70	4259.87		4259.94	0.001945	2.13	2858.84	2356.73	0.34
Mountain Vistas	3	PF 1	6071.30	4257.62	4259.78		4259.85	0.002120	2.16	2817.40	2439.67	0.35
Mountain Vistas	2.875*	PF 1	6046.89	4257.49	4259.68		4259.75	0.002156	2.16	2801.80	2450.55	0.36
Mountain Vistas	2.75*	PF 1	6013.49	4257.36	4259.58		4259.65	0.002188	2.16	2785.73	2461.42	0.36
Mountain Vistas	2.625*	PF 1	5969.76	4257.23	4259.48		4259.55	0.002274	2.17	2747.71	2477.17	0.36
Mountain Vistas	2.5*	PF 1	5915.11	4257.09	4259.37		4259.44	0.002360	2.18	2711.54	2507.88	0.37
Mountain Vistas	2.375*	PF 1	5849.19	4256.96	4259.25		4259.33	0.002562	2.22	2639.06	2538.62	0.38
Mountain Vistas	2.25*	PF 1	5772.26	4256.83	4259.12		4259.20	0.002941	2.30	2521.24	2552.19	0.41
Mountain Vistas	2.125*	PF 1	5685.53	4256.70	4258.97		4259.06	0.003273	2.42	2355.39	2381.62	0.43
Mountain Vistas	2	PF 1	5592.25	4256.57	4258.78		4258.89	0.004049	2.63	2125.80	2213.31	0.47
Mountain Vistas	1.91666*	PF 1	5500.59	4256.46	4258.60		4258.71	0.004041	2.60	2122.03	2257.78	0.47
Mountain Vistas	1.83333*	PF 1	5413.35	4256.35	4258.42		4258.52	0.004053	2.56	2119.14	2312.86	0.47
Mountain Vistas	1.75*	PF 1	5330.79	4256.24	4258.24		4258.34	0.004049	2.52	2120.05	2363.72	0.47
Mountain Vistas	1.66666*	PF 1	5252.80	4256.13	4258.07		4258.16	0.004068	2.47	2132.92	2469.99	0.47
Mountain Vistas	1.58333*	PF 1	5179.15	4256.02	4257.88		4257.98	0.004190	2.43	2137.74	2593.58	0.47
Mountain Vistas	1.5*	PF 1	5109.82	4255.91	4257.70		4257.79	0.004264	2.40	2127.92	2643.45	0.47
Mountain Vistas	1.41666*	PF 1	5044.72	4255.80	4257.51		4257.60	0.004247	2.38	2119.00	2657.96	0.47
Mountain Vistas	1.33333*	PF 1	4983.71	4255.69	4257.32		4257.41	0.004224	2.36	2111.57	2671.88	0.47
Mountain Vistas	1.25*	PF 1	4926.69	4255.58	4257.13		4257.22	0.004209	2.34	2103.56	2685.16	0.47
Mountain Vistas	1.16666*	PF 1	4873.58	4255.47	4256.94		4257.03	0.004162	2.32	2101.13	2697.61	0.46
Mountain Vistas	1.08333*	PF 1	4824.13	4255.36	4256.76		4256.84	0.004098	2.29	2102.48	2709.68	0.46
Mountain Vistas	1	PF 1	4806.61	4255.25	4256.58	4256.21	4256.66	0.004003	2.27	2117.10	2724.68	0.45

4-180 post chalfant R6 with sound wall Plan: Plan 01 6/21/2005 3:33:15 PM

Geom: Mountain Vistas Flow: Flow 02

Legend	
	WS PF 1
	Ground
	Bank Sta
	Ground
	Lat Struct

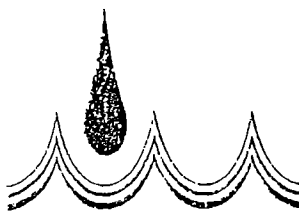


POST DEVELOPMENT VERSUS PREDEVELOPMENT WATER SURFACE ELEVATION DIFFERENCE																
	POST	IPRE		IPOST	PRE		POST	IPRE		IPOST	PRE		POST	IPRE		
	9	4282.06	4282.06	0	8	4273.65	4273.65	0.00		6	4266.81	4266.77	0.04	4	4260.37	4260.35
		4281.89	4281.89	0				0.00			4266.67	4266.64	0.03		4260.3	4260.28
		4281.71	4281.71	0		4273.42	4273.42	0.00			4266.56	4266.51	0.05		4260.23	4260.21
		4281.53	4281.53	0		4273.18	4273.18	0.00			4266.43	4266.35	0.08		4260.16	4260.14
		4281.35	4281.35	0		4272.94	4272.94	0.00			4266.24	4266.18	0.06		4260.09	4260.07
		4281.16	4281.16	0		4272.72	4272.71	0.01			4265.99	4265.93	0.06		4260.02	4260
		4280.98	4280.98	0		4272.48	4272.48	0.00			4265.84	4265.78	0.06		4259.94	4259.93
		4280.78	4280.78	0		4272.25	4272.24	0.01			4265.72	4265.67	0.05		4259.87	4259.85
		4280.58	4280.58	0		4272.01	4272.01	0.00			4265.59	4265.51	0.08	3	4259.78	4259.76
		4280.38	4280.38	0		4271.78	4271.77	0.01			4265.45	4265.35	0.10		4259.68	4259.66
		4280.18	4280.18	0		4271.54	4271.54	0.00			4265.25	4265.21	0.04		4259.58	4259.56
		4279.97	4279.97	0		4271.3	4271.31	-0.01			4265.13	4265.06	0.07		4259.48	4259.46
		4279.76	4279.76	0		4271.04	4271.07	-0.03			4265.01	4264.93	0.08		4259.37	4259.35
		4279.55	4279.55	0		4270.8	4270.83	-0.03			4264.86	4264.75	0.11		4259.25	4259.23
		4279.34	4279.34	0		4270.56	4270.58	-0.02			4264.73	4264.61	0.12		4259.12	4259.1
		4279.12	4279.12	0		4270.34	4270.34	0.00			4264.62	4264.5	0.12		4258.97	4258.95
		4278.91	4278.91	0	7	4270.1	4270.11	-0.01			4264.3	4264.24	0.06	2	4258.78	4258.76
		4278.69	4278.69	0		4269.9	4269.92	-0.02			4264.04	4264.02	0.02		4258.6	4258.58
		4278.47	4278.47	0		4269.61	4269.62	-0.01		5	4263.95	4263.94	0.01		4258.42	4258.4
		4278.25	4278.25	0		4269.39	4269.39	0.00			4263.85	4263.82	0.03		4258.24	4258.22
		4278.03	4278.03	0		4269.17	4269.16	0.01			4263.77	4263.72	0.05		4258.07	4258.05
		4277.8	4277.8	0		4268.9	4268.92	-0.02			4263.69	4263.66	0.03		4257.88	4257.87
		4277.58	4277.58	0		4268.7	4268.69	0.01			4263.55	4263.55	0.00		4257.7	4257.68
		4277.36	4277.36	0		4268.47	4268.45	0.02			4263.54	4263.52	0.02		4257.51	4257.49
		4277.13	4277.13	0		4268.25	4268.22	0.03		4.7	4263.04	4263.04	0.00		4257.32	4257.3
		4276.91	4276.91	0		4267.99	4267.99	0.00			4262.41	4262.4	0.01		4257.13	4257.12
		4276.68	4276.68	0		4267.75	4267.75	0.00			4262.22	4262.2	0.02		4256.94	4256.93
		4276.45	4276.45	0		4267.53	4267.52	0.01			4261.88	4261.87	0.01		4256.76	4256.75
		4276.23	4276.23	0		4267.35	4267.3	0.05			4261.54	4261.52	0.02		4256.58	4256.57
		4275.99	4275.99	0		4267.11	4267.09	0.02			4261.24	4261.23	0.01	1	4256.58	4256.57
		4275.77	4275.77	0		4266.96	4266.91	0.05			4260.92	4260.91	0.01			
		4275.54	4275.54	0							4260.62	4260.61				
		4275.31	4275.31	0							4260.45	4260.43				
		4275.08	4275.08	0												
		4274.85	4274.85	0												
		4274.62	4274.62	0												
		4274.39	4274.39	0												
		4274.15	4274.15	0												
		4273.9	4273.9	0												



Preliminary Base Flood Elevation Study
Mountain Vistas

Appendix E
Hydrology Calculations
WRC Nevada, Inc.



WRC NEVADA, INC.

July 11, 2003

Andy Holmes
Triad/Holmes Associates
549 Old Mammoth Road, Suite 202
Mammoth Lakes, CA 93546

Subject: Tentative Tract Map, 372 Chalfant Road
Approximate Hydrologic Analysis
WRC Job No.: 3117

Dear Mr. Holmes:

This letter summarizes the requested approximate hydrologic analysis for your project located at 372 Chalfant Road, West Chalfant, California. The project is a 15 lot subdivision as shown on the attached drawing (Attachment #1) provided to WRC by Triad/Holmes Associates. The site is shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel 184, dated August 19, 1985 (Attachment #2). The FEMA FIRM shows an approximate Zone A boundary for the unnamed watercourse that crosses through the center of the site from north to south.

The presence of an approximate FEMA Zone A requires that base flood elevations (BFE) be determined for setting finished floor elevations. Mono County's ordinance will allow the use of existing studies for making this determination if such studies have been prepared. In the absence of technical data, the applicant is required to prepare any studies necessary for establishing the BFE's. Based upon conversations WRC had with Kelly Garcia with Mono County Department of Public Works, the County will be willing to consider approximate studies to determine BFE's if those studies are based upon commonly accepted methods. There are two parts to such an estimate. First, an estimate of the 100-year peak discharge is required. Secondly, using the estimate of 100-year peak discharge, estimates of the water surface elevations at each location within the project area need to be estimated. It was concluded that WRC would provide an approximate analysis of the 100-year peak discharge and Triad/Holmes Associates would generate estimates of the BFEs based on that discharge estimate. This letter provides the results of WRC's approximate estimate of the 100-year peak discharges for the project site.

CONSULTING ENGINEERS

1640 SOUTH MCCARRAN BLVD. • SUITE B • RENO, NEVADA 89509 • TELE 332-3737 • FAX 775.332-3740

Hydrologic Analysis - Level of Detail

Based upon your review of the project requirements with the client and Mono County, it was concluded that an approximate hydrologic analysis would be sufficient for this project. This conclusion was reached for the following reasons:

- The project size is not sufficient to warrant the expense of a detailed hydrologic study if reasonable and conservative estimates could provide adequately defensible results...
- The wide shallow nature of the floodplain results in a small changes in water surface elevation with significant changes in the discharge estimate.

The watershed contributing to this project is located north of the project site and is 486 square miles in size (Attachment #3). The watershed is bounded on the west by the Benton Range and on the east by the White Mountains and extends north across the California / Nevada border. This watershed drains south through Hammil Valley to Chalfant Valley. Flows from extreme events will flow as very wide shallow flow through Hammil Valley and Chalfant Valley. This watershed is shown on the attached figure.

Selection of Hydrologic Methods

The method selected for estimating the 100-year peak discharge was the use of regional regression relationships prepared by the US Geological Survey as described in the report; Methods for Estimating Magnitude and Frequency of Floods in the Southwestern United States, USGS Open File Report 93-419 (1994) (Attachment #4). This reference was used because of its acceptability by FEMA for use in estimating peak discharges or for verification of peak flow estimates developed by other methods. This is a commonly used method with wide acceptance for developing peak flow estimates.

The USGS subdivided the Southwest into regions with similar hydrologic characteristics and utilized observed peak discharge estimates from gaged watersheds to develop regression equations for each region. This watershed lies within Region 5 but lies close to the boundary of Region 6. Regional regression methods produce reasonable estimates of peak discharge when the watershed that the equations are being applied to, are similar to the watersheds included in the regression analysis. Less certainty would be expected when the regression equations are applied to watersheds that differ significantly from the gaged watersheds included in the data set.

The watershed being analyzed for this study differs from the regression data set in the following ways:

- The main thread of the stream course through the center of the watershed is very small in relationship to its adjoining floodplain. Therefore, extreme events typically flow as wide shallow flow over much of the main watercourse reach. This condition would result in significant attenuation of peak flows during extreme events as compared to a watershed where the primary channel conveys a more significant percentage of the extreme event flows.
- More than half of the watercourses used in the regression analysis have watershed areas that are less than 50 square miles. Only five of the gaged watersheds in the analysis were greater than 100 square miles. The five data points for the larger watersheds are located on the West Walker River (2 values), the East Fork of the Carson River (2 values) and the Carson River near Carson (see attached excerpt from the USGS study). These gaged sites are watercourses with a significantly higher percentage of conveyance in the primary channel. Therefore, the regression results would be expected to produce conservative values for the watershed being evaluated in this study.
- The orientation of the watershed in this study differs from the orientation and characteristics of the watersheds in the regression data set. Most of the watersheds in the regression data set are oriented so that the primary watercourse is located perpendicular to the mountain front. Therefore, the data set is for watercourses that typically have steeper slopes for the primary watercourse. Extreme event peak flows are highly influenced by travel time in the primary watercourse. The regression analysis does not include length of slope of the primary watercourse as a factor in the regression analysis. The watercourse for the project area watershed has a much shallower watercourse slope and therefore, is not characteristic of the other watersheds in the USGS regression study area with respect to slope of the primary watercourse.
- Due to the orientation and physical location of the watershed relative to the Sierra Crest, much of the watershed would be located in the precipitation shadow of the Sierras. Therefore, the precipitation differences between this watershed and the gaged watersheds in the regression analysis, could be significant.

All of these factors would suggest that the results obtained from the USGS regression equations would tend to be overly conservative when applied to the watershed for this project. The watershed area was determined by obtaining the USGS Digital Elevation Models in ArcView format. The watershed divide was delineated in ArcView based on these data from the USGS. The watershed area was then obtained from the resulting mapping.

Results

Attached are the computations and plotted discharge frequency curves for Regions 5 and 6 (Attachment #5). Region 6 is provided for comparison purposes. The watershed is entirely in Region 5. However, due to the factors described above, the watersheds in the Region 6 regression analysis may be hydrologically more similar to the study area, than the watersheds included in the Region 5 regression analysis. However, Region 6 appears to have two distinct populations in the data (see Attachment #4). The watersheds closer to, and more similar to, the project area are in a cluster of data that has a flatter trend. The results produced by the Region 6 equation produces results consistent with that flatter trend to the data.

Based on the use of the regression equations, the 100-year peak flow estimate at this site would be between 6,000 and 10,000 cfs. In order to test the sensitivity of the results to water surface elevation or depth of flooding, a cross section was extracted from the site topography along the roadway centerline (Attachment #6). It should be noted that the flow is not contained at Chalfant Road, therefore these depths should not be used for determination of base flood elevations (BFEs). Additional surveying is needed to define the limits of potential flooding on the east side of the floodplain. The attached analysis is presented only for comparison of water surface elevation differences with changes in peak discharge estimate. The difference in estimated depth using the lower and upper end of the range of discharge estimates, is 0.9'. Inclusion of the entire floodplain in the analysis will decrease the water surface elevations and decrease the relative difference in water surface elevations between the two estimated 100-year discharge values.

Recommendations

Based on our analysis and findings, we recommend the following:

- Although the Region 5 estimate is likely to be conservative, we recommend using this estimate for project planning purposes.
- We recommend that you obtain additional topographic data east of Chalfant Road to determine the location of the east side of the floodplain. Inclusion of the entire floodplain in the hydraulic analysis should provide a more representative water surface elevation. We also recommend that you confirm that the entire area considered to be in the floodplain can experience flood flows (not protected by levees, roads, etc.).
- We recommend that a minimum of 5 cross sections be used for estimating the water surface profile through the project site. These cross sections should be located: at a location approximately 100' to 300' upstream of the north property line; at the north property line; at the roadway center line at the center of the project; at the south property line; and at a point approximately 100' to 300' south of the south property line.

- We recommend that you confirm that there are no downstream constrictions, roadways, channel obstructions or other factors that would influence the gradient of the water surface through the project site.
- If a more refined estimate of peak discharge and water surface profile is desired, more detailed methods of analysis would need to be employed. However, the expense of the detailed methods may not be necessary if conservative estimates of peak flow and water surface elevations are used for establishing finished floor elevations and project impacts.
- We recommend that building pads located in the floodplain be protected against erosion. Channel migration in these sandy soils in the project area is likely during extreme events and the erodible soils will be subject to local scour around the corners of building pads where localized velocities increases are likely due to contractions caused by the encroachment represented by an elevated fill pad in the flow path.

I trust that this information will be useful to you in your project planning. If I can be of any further assistance, feel free to call me at (775) 332-3737.

Sincerely,

WRC Nevada, Inc.



Mark E. Forest
President

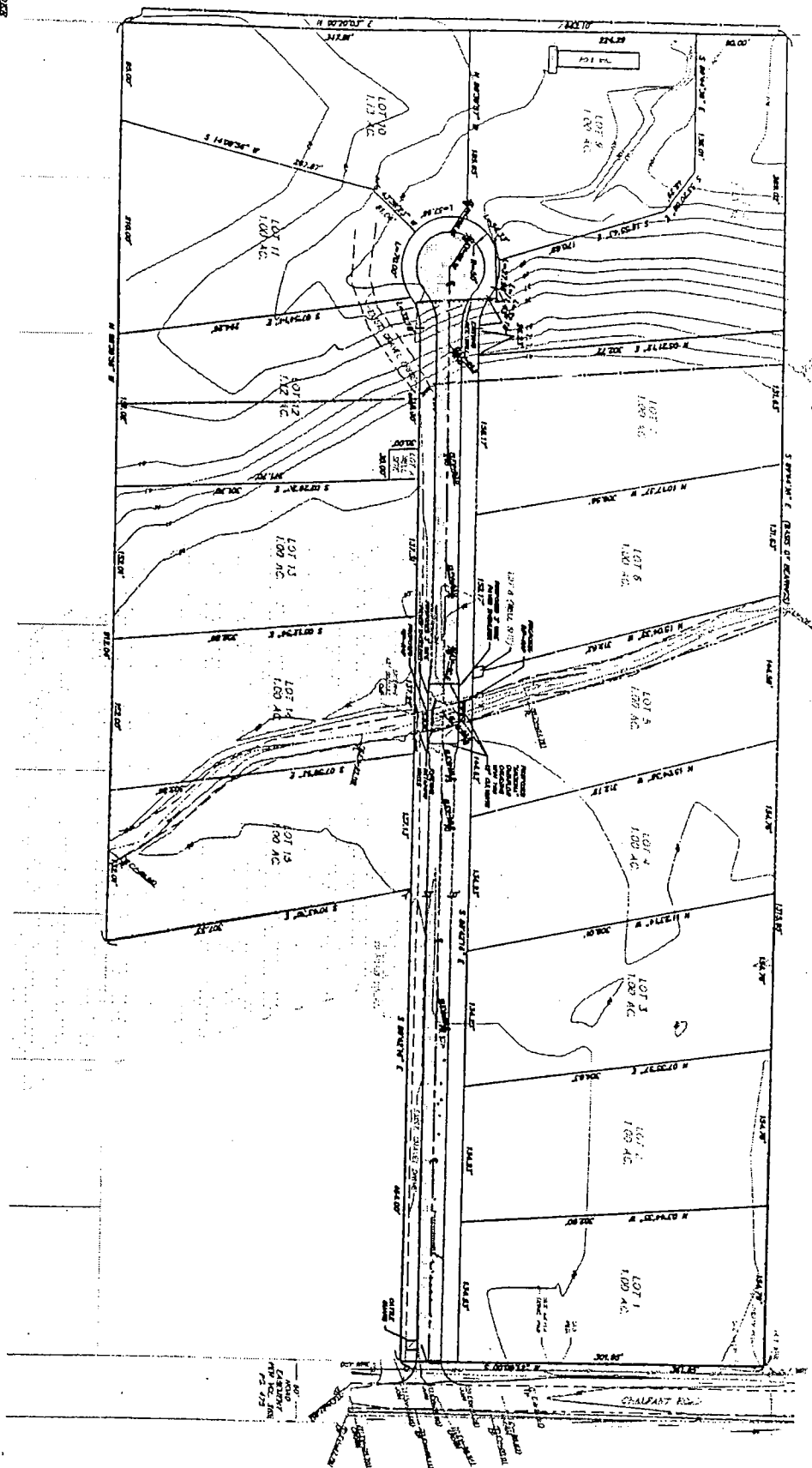
Enclosures

MEF:dah

Attachment #1

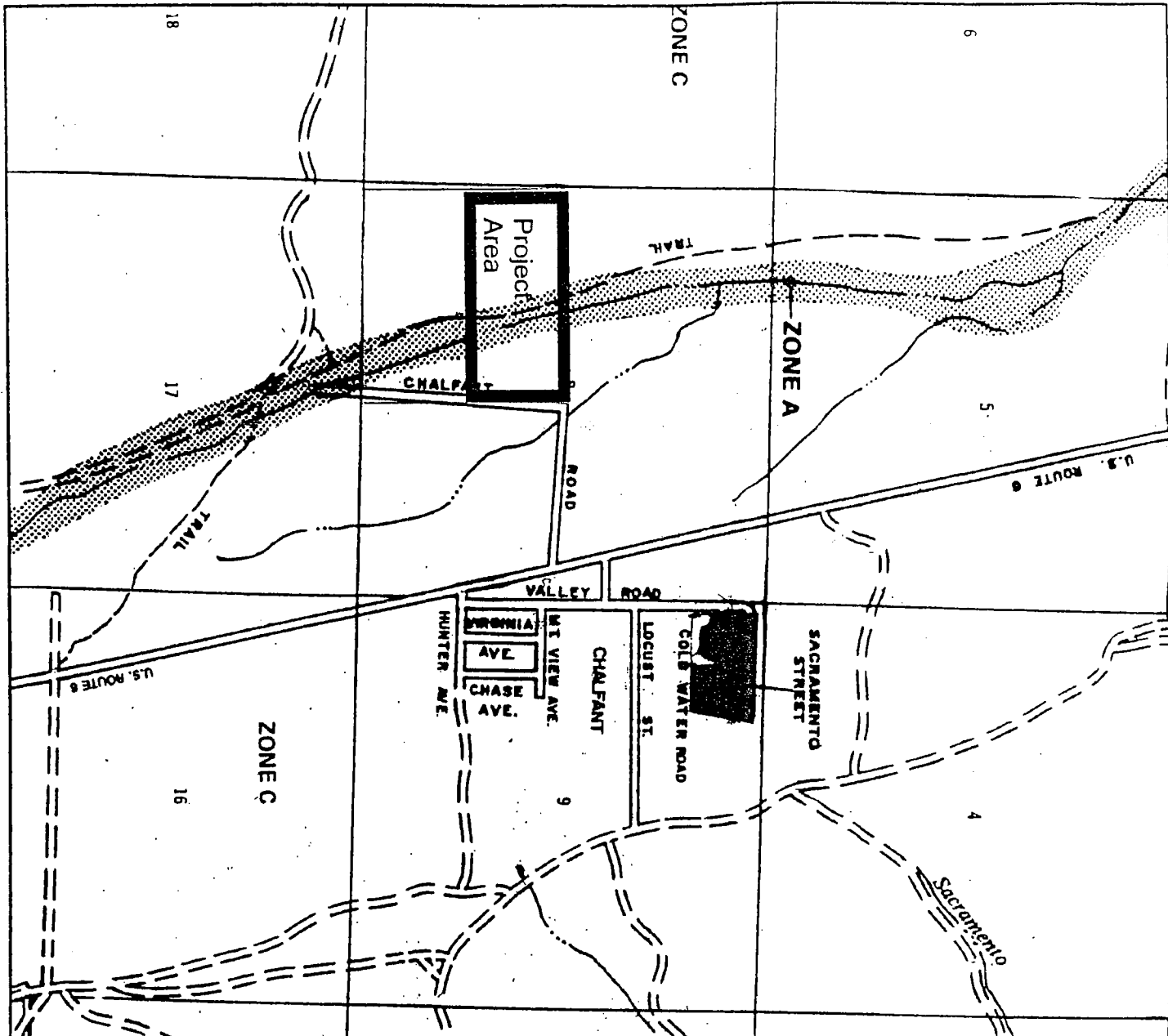
Parcel Map Prepared by Triad/Holmes

1. 1941
 2. 1942
 3. 1943
 4. 1944
 5. 1945
 6. 1946
 7. 1947
 8. 1948
 9. 1949
 10. 1950
 11. 1951
 12. 1952
 13. 1953
 14. 1954
 15. 1955
 16. 1956
 17. 1957
 18. 1958
 19. 1959
 20. 1960
 21. 1961
 22. 1962
 23. 1963
 24. 1964
 25. 1965
 26. 1966
 27. 1967
 28. 1968
 29. 1969
 30. 1970
 31. 1971
 32. 1972
 33. 1973
 34. 1974
 35. 1975
 36. 1976
 37. 1977
 38. 1978
 39. 1979
 40. 1980
 41. 1981
 42. 1982
 43. 1983
 44. 1984
 45. 1985
 46. 1986
 47. 1987
 48. 1988
 49. 1989
 50. 1990
 51. 1991
 52. 1992
 53. 1993
 54. 1994
 55. 1995
 56. 1996
 57. 1997
 58. 1998
 59. 1999
 60. 2000
 61. 2001
 62. 2002
 63. 2003
 64. 2004
 65. 2005
 66. 2006
 67. 2007
 68. 2008
 69. 2009
 70. 2010
 71. 2011
 72. 2012
 73. 2013
 74. 2014
 75. 2015
 76. 2016
 77. 2017
 78. 2018
 79. 2019
 80. 2020
 81. 2021
 82. 2022
 83. 2023
 84. 2024
 85. 2025
 86. 2026
 87. 2027
 88. 2028
 89. 2029
 90. 2030
 91. 2031
 92. 2032
 93. 2033
 94. 2034
 95. 2035
 96. 2036
 97. 2037
 98. 2038
 99. 2039
 100. 2040
 101. 2041
 102. 2042
 103. 2043
 104. 2044
 105. 2045
 106. 2046
 107. 2047
 108. 2048
 109. 2049
 110. 2050
 111. 2051
 112. 2052
 113. 2053
 114. 2054
 115. 2055
 116. 2056
 117. 2057
 118. 2058
 119. 2059
 120. 2060
 121. 2061
 122. 2062
 123. 2063
 124. 2064
 125. 2065
 126. 2066
 127. 2067
 128. 2068
 129. 2069
 130. 2070
 131. 2071
 132. 2072
 133. 2073
 134. 2074
 135. 2075
 136. 2076
 137. 2077
 138. 2078
 139. 2079
 140. 2080
 141. 2081
 142. 2082
 143. 2083
 144. 2084
 145. 2085
 146. 2086
 147. 2087
 148. 2088
 149. 2089
 150. 2090
 151. 2091
 152. 2092
 153. 2093
 154. 2094
 155. 2095
 156. 2096
 157. 2097
 158. 2098
 159. 2099
 160. 2100
 161. 2101
 162. 2102
 163. 2103
 164. 2104
 165. 2105
 166. 2106
 167. 2107
 168. 2108
 169. 2109
 170. 2110
 171. 2111
 172. 2112
 173. 2113
 174. 2114
 175. 2115
 176. 2116
 177. 2117
 178. 2118
 179. 2119
 180. 2120
 181. 2121
 182. 2122
 183. 2123
 184. 2124
 185. 2125
 186. 2126
 187. 2127
 188. 2128
 189. 2129
 190. 2130
 191. 2131
 192. 2132
 193. 2133
 194. 2134
 195. 2135
 196. 2136
 197. 2137
 198. 2138
 199. 2139
 200. 2140
 201. 2141
 202. 2142
 203. 2143
 204. 2144
 205. 2145
 206. 2146
 207. 2147
 208. 2148
 209. 2149
 210. 2150
 211. 2151
 212. 2152
 213. 2153
 214. 2154
 215. 2155
 216. 2156
 217. 2157
 218. 2158
 219. 2159
 220. 2160
 221. 2161



Attachment #2

Excerpt from FEMA Flood Insurance Rate Map
for Project Area



APPROXIMATE SCALE

2000 0 2000 4000 6000 FEET

FEDERAL EMERGENCY MANAGEMENT AGENCY

MONO COUNTY, CA
(UNINCORPORATED AREAS)

EFFECTIVE DATE

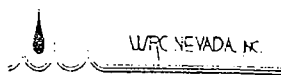
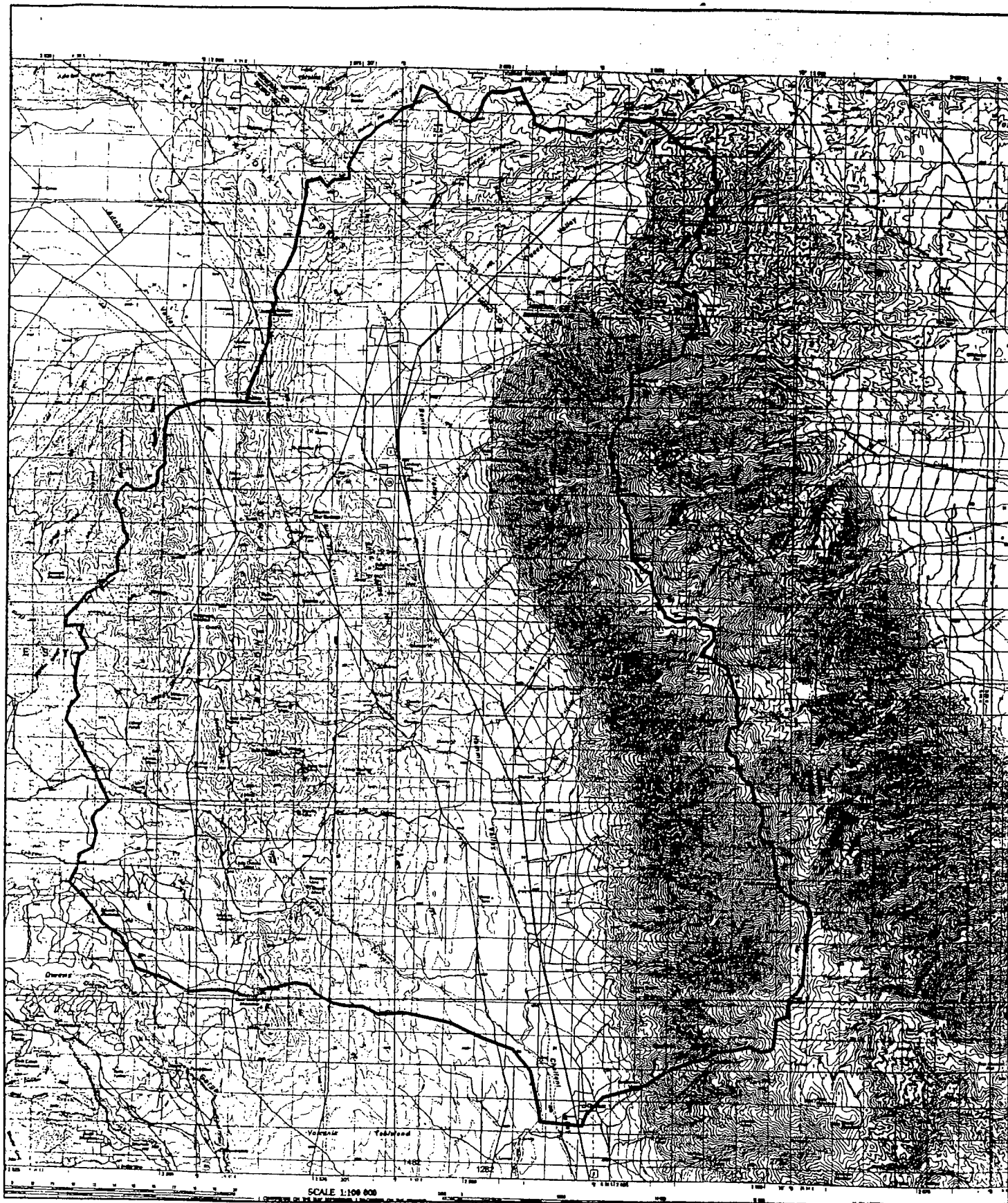
AUGUST 19, 1985

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

184

Attachment #3

Watershed Map



Chalfant Watershed Flood Frequency Analysis

Legend

 Watershed Boundary

1 inch equals 4 miles



Attachment #4

Excerpts from USGS Open File Report 93-419

Methods for Estimating Magnitude and Frequency of Floods in the Southwestern United States

By BLAKEMORE E. THOMAS, H.W. HJALMARSON,
and S.D. WALTEMEYER

U.S. GEOLOGICAL SURVEY
Open-File Report 93—419

Prepared in cooperation with the
COLORADO DEPARTMENT OF HIGHWAYS,
ARIZONA DEPARTMENT OF TRANSPORTATION,
CALIFORNIA DEPARTMENT OF TRANSPORTATION,
IDAHO DEPARTMENT OF TRANSPORTATION,
NEVADA DEPARTMENT OF TRANSPORTATION,
NEW MEXICO STATE HIGHWAY AND TRANSPORTATION
DEPARTMENT,
OREGON DEPARTMENT OF TRANSPORTATION,
TEXAS DEPARTMENT OF TRANSPORTATION, and
UTAH DEPARTMENT OF TRANSPORTATION



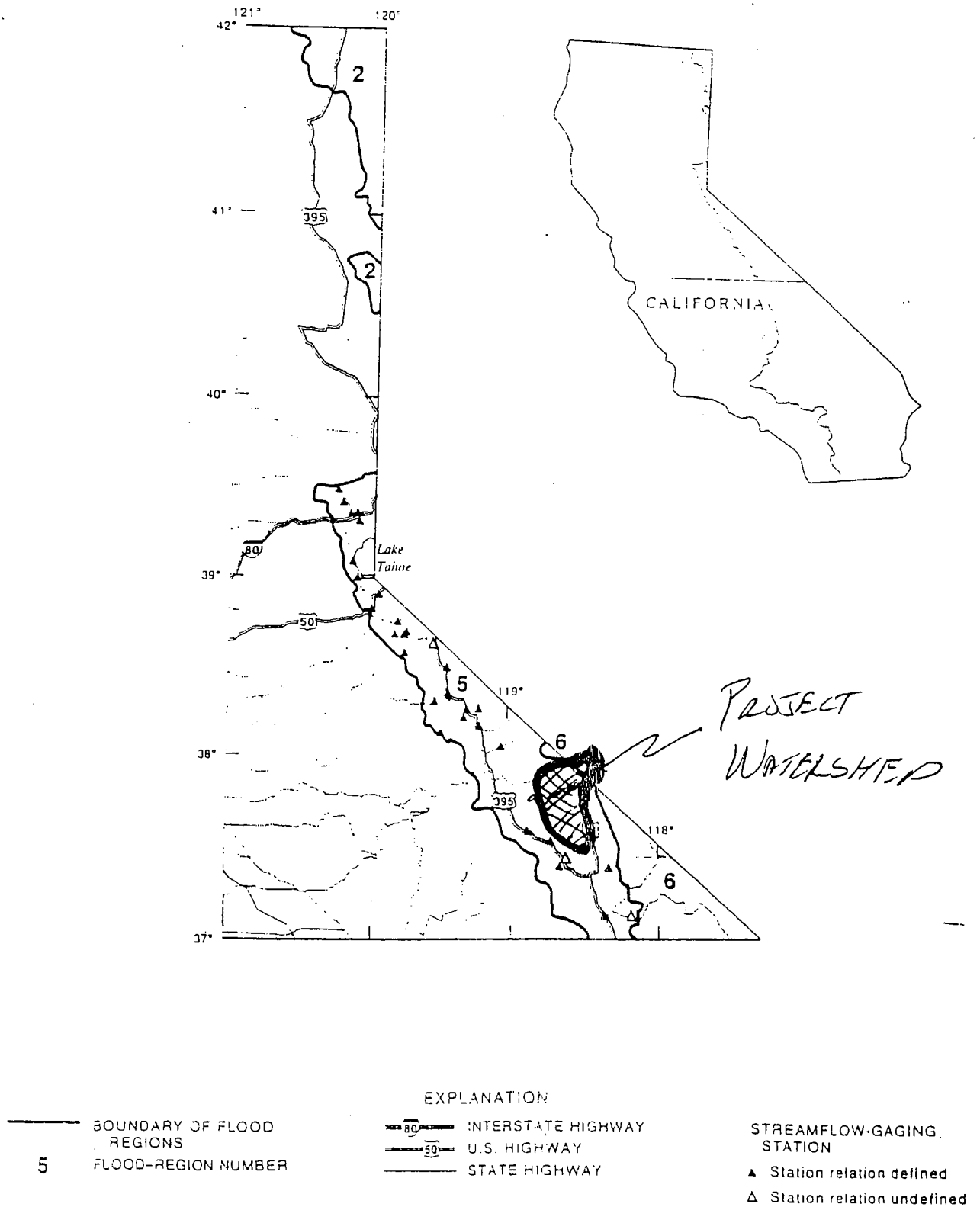


Figure 3. Flood regions in California.

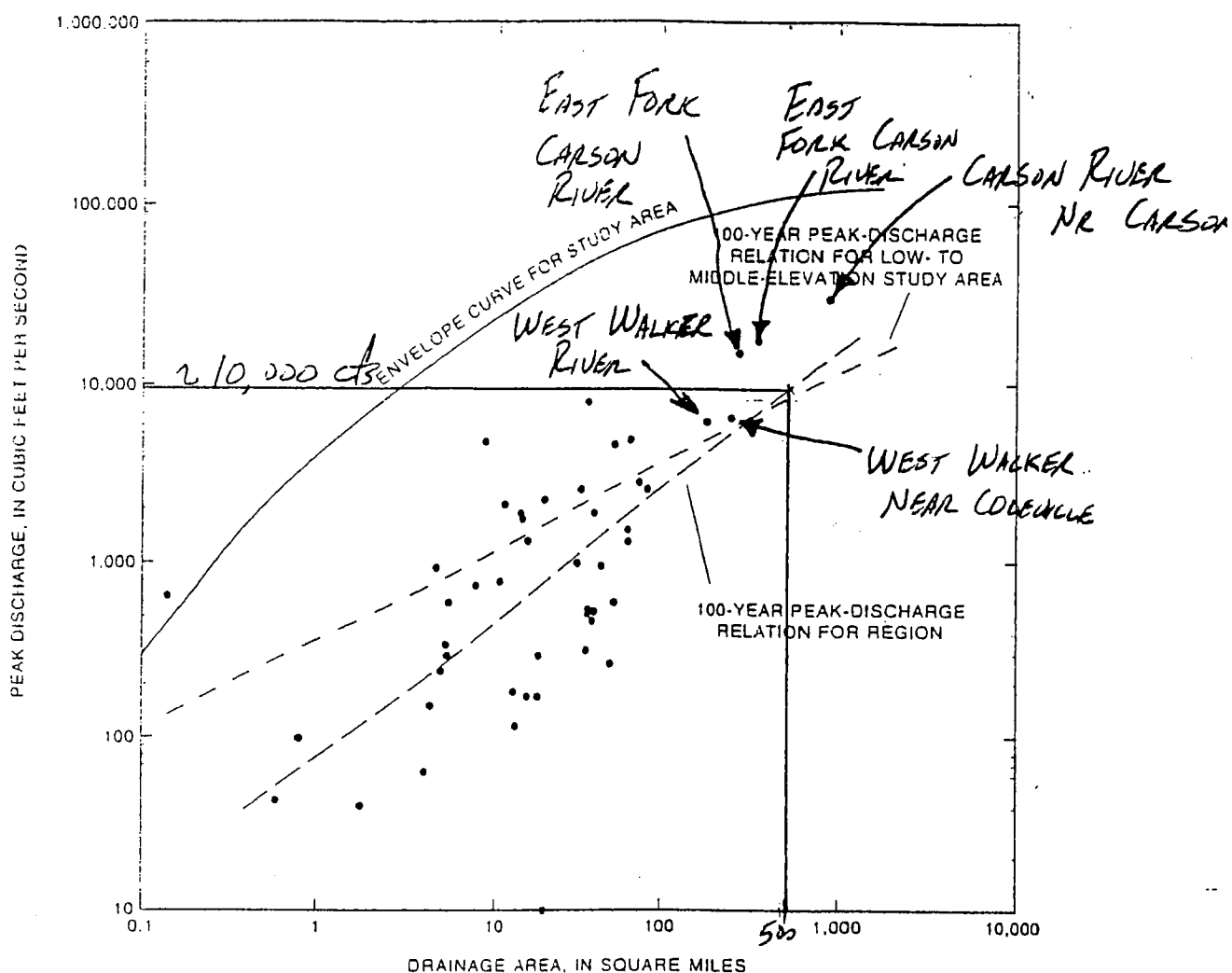


Figure 28. Relations between 100-year peak discharge and drainage area and plot of maximum peak discharge of record and drainage area for gaged sites in the Eastern Sierras Region 5.

Table 9. Generalized least-squares regression equations for estimating regional flood-frequency relations for the Eastern Sierras Region 5

Equation: Q, peak discharge, in cubic feet per second; AREA, drainage area, in square miles; ELEV, mean basin elevation, in feet; and LAT, latitude of site, in decimal degrees. Data were based on 37 stations. Average number of years of systematic record is 31.

Recurrence Interval, in years	Equation	Average standard error of prediction, in percent	Equivalent years of record
2	$Q=0.0333\text{AREA}^{0.353}(\text{ELEV}/1,000)^{2.68}[(\text{LAT}-28)/10]^{4.1}$	135	0.21
5	$Q=2.42\text{AREA}^{0.323}(\text{ELEV}/1,000)^{1.01}[(\text{LAT}-28)/10]^{4.1}$	101	.73
10	$Q=28.0\text{AREA}^{0.326}[(\text{LAT}-28)/10]^{4.3}$	84	1.69
25	$Q=426\text{AREA}^{0.312}(\text{ELEV}/1,000)^{-1.10}[(\text{LAT}-28)/10]^{4.3}$	87	2.62
50	$Q=2,030\text{AREA}^{0.798}(\text{ELEV}/1,000)^{-1.71}[(\text{LAT}-28)/10]^{4.4}$	91	3.26
100	$Q=7,000\text{AREA}^{0.782}(\text{ELEV}/1,000)^{-2.18}[(\text{LAT}-28)/10]^{4.6}$	95	3.80

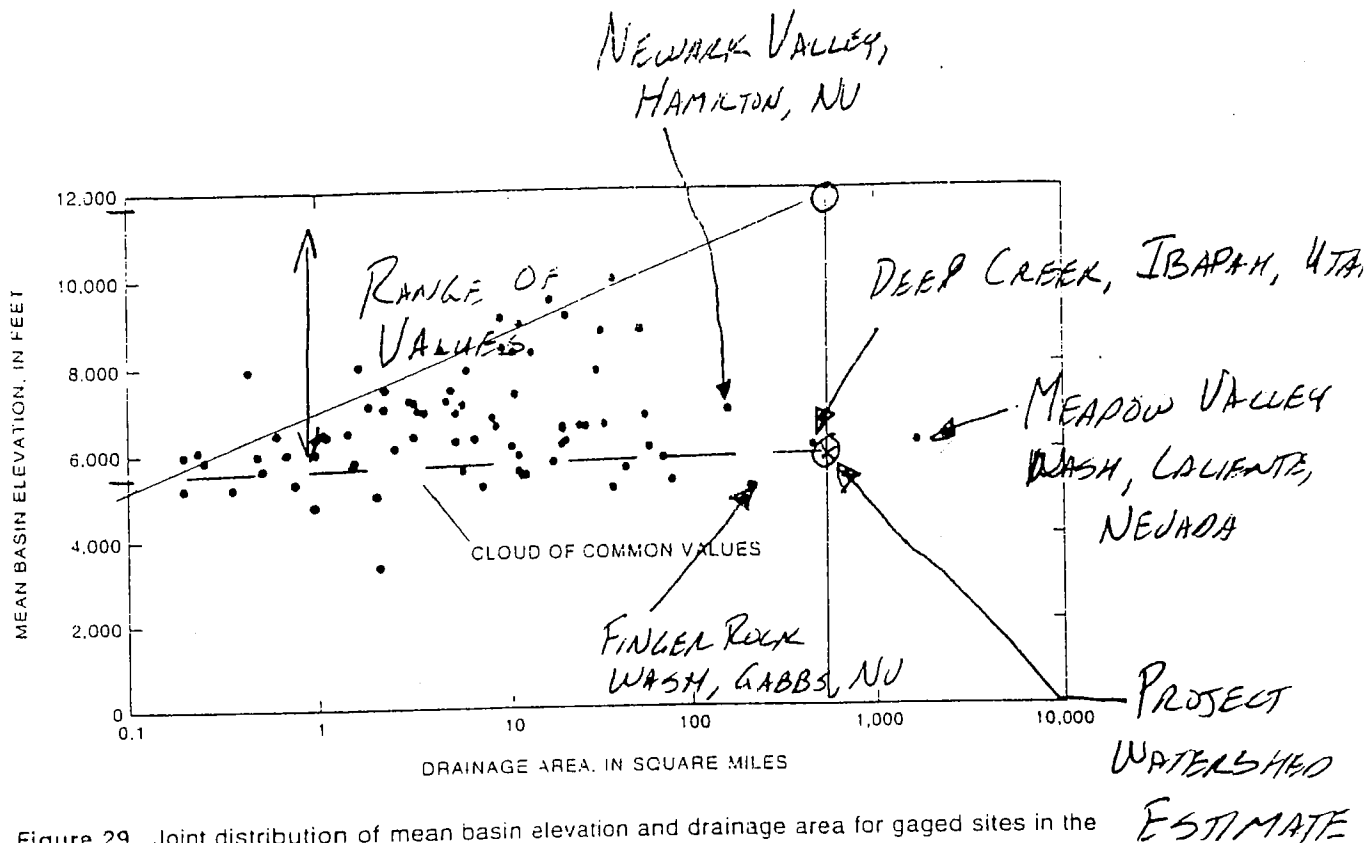


Figure 29. Joint distribution of mean basin elevation and drainage area for gaged sites in the Northern Great Basin Region 6.

Table 10. Hybrid equations for estimating regional flood-frequency relations for the Northern Great Basin Region 6
Equation: Q , peak discharge, in cubic feet per second; AREA, drainage area, in square miles; and ELEV, mean basin elevation, in feet. Data were based on 80 stations. Dashes indicate no data. Average number of years of systematic record is 19.
Estimated average standard error of regression for the hybrid method includes much of the within-station residual variance and therefore is not comparable to standard error of estimate from an ordinary least-squares regression. See section entitled "Hybrid Method" for explanation of error.

Recurrence Interval, in years	Equation	Estimated average standard error of regression, in log units	Equivalent years of record
2	$Q=0$	—	—
5	$Q=32\text{AREA}^{0.80}(\text{ELEV}/1,000)^{-0.66}$	1.47	0.233
10	$Q=590\text{AREA}^{0.62}(\text{ELEV}/1,000)^{-1.6}$	1.12	.748
25	$Q=3,200\text{AREA}^{0.62}(\text{ELEV}/1,000)^{-2.1}$.796	2.52
50	$Q=5,300\text{AREA}^{0.64}(\text{ELEV}/1,000)^{-2.1}$	1.10	1.75
100	$Q=20,000\text{AREA}^{0.51}(\text{ELEV}/1,000)^{-2.3}$	1.84	.794

Attachment #5

Results of Application of Regional Regression Equations
for Project Area

Chalfant Peak Discharge Calculations
 For Triad/Holmes Associates
 10-Jul-03

Watershed Area	Mean Basin Elevation	Outlet Point Latitude
486	6916	37.5

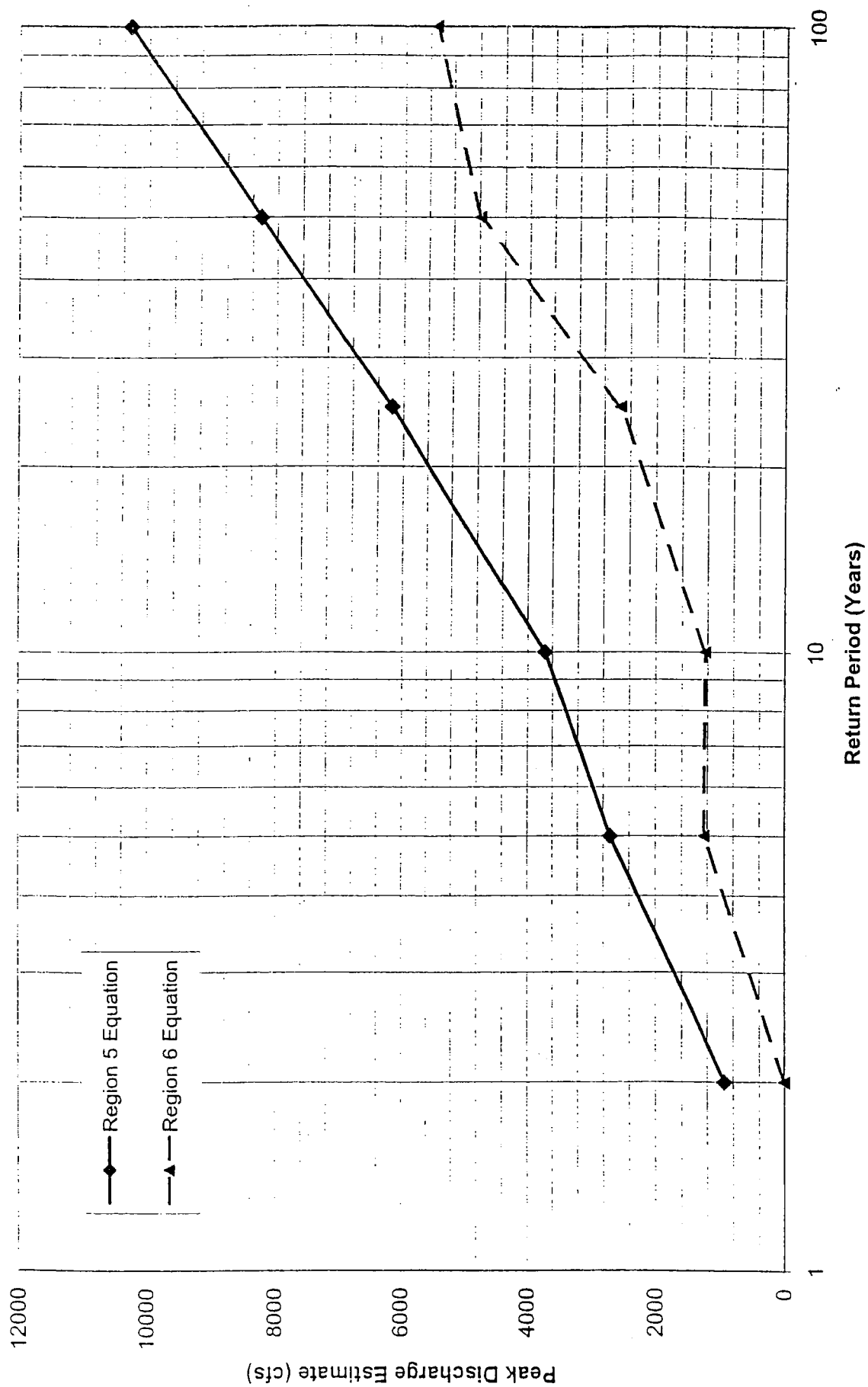
USGS, 1994

Region 5	
Recurrence Interval	Estimated Q, in cfs
2	941
5	2695
10	3720
25	6185
50	8265
100	10297

USGS, 1994

Region 6	
Recurrence Interval	Estimated Q, in cfs
2	0
5	1259
10	1238
25	2554
50	4787
100	5490

Chalfant Discharge Frequency Estimates



Attachment #6

BFE Sensitivity Analysis
for Project Area

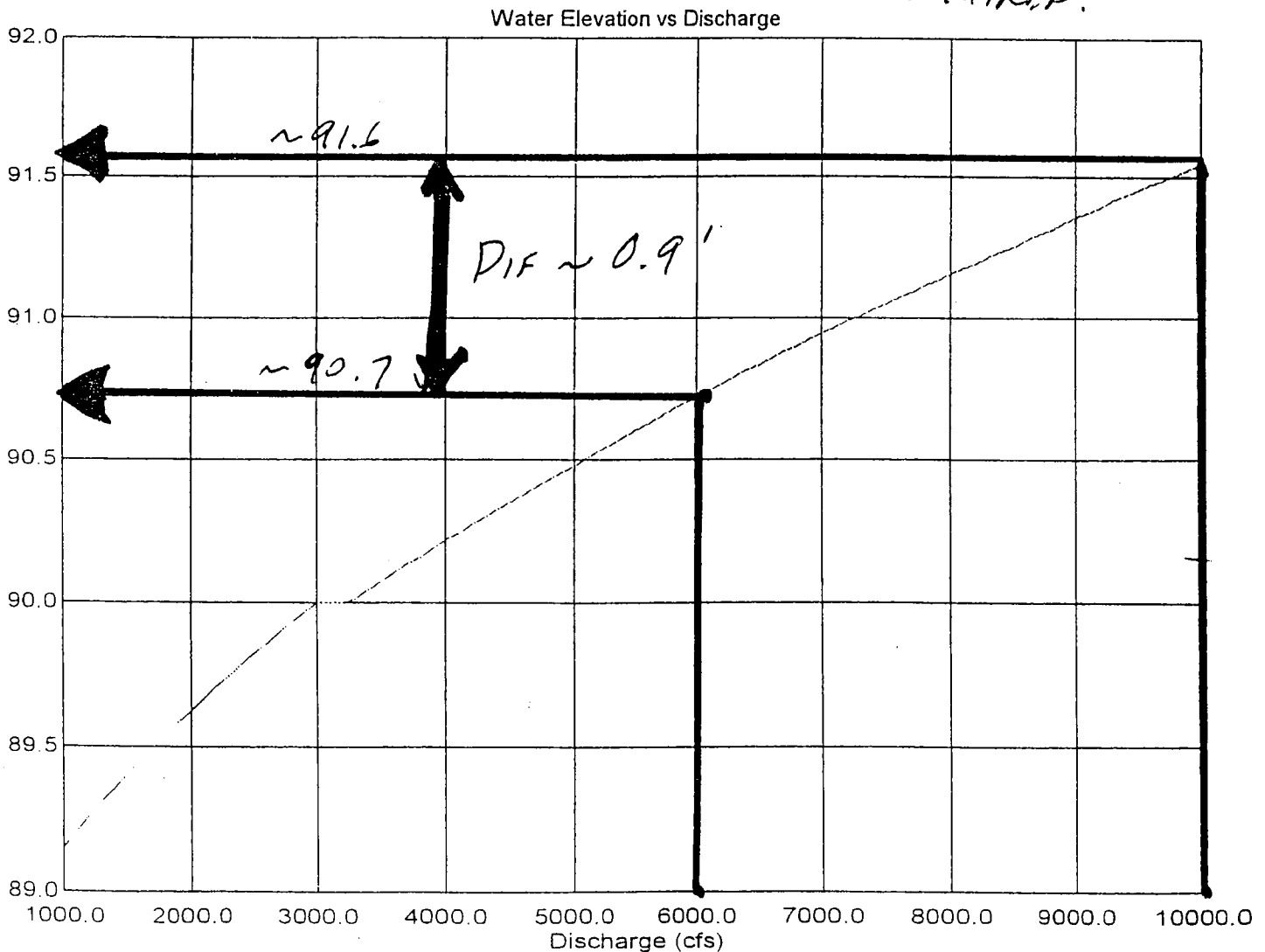
Curve
Plotted Curves for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\chalfant.fm2
Worksheet	Approximate FP
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Constant Data	
Channel Slope	0.003700 ft/ft

Input Data			
	Minimum	Maximum	Increment
Discharge	1,000.00	10,000.00	100.00 cfs

FOR SENSITIVITY
ESTIMATE PURPOSES
ONLY! DO NOT
USE FOR BFE DETERMINATION
ADDITIONAL SURVEYING
REQUIRED.



Chalfant
Worksheet for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\chalfant.fm2
Worksheet	Approximate FP
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data				
Channel Slope		0.003700 ft/ft		
Elevation range: 88.00 ft to 96.00 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	96.00	0.00	372.00	0.060
45.00	91.00	372.00	410.00	0.040
56.00	90.00	410.00	1,055.00	0.060
256.00	89.00			
372.00	89.00			
375.00	88.00			
387.00	88.00			
410.00	89.00			
540.00	88.00			
1,040.00	88.00			
1,055.00	88.54			
Discharge	10,000.00	cfs		

Results		
Wtd. Mannings Coefficient	0.058	
Water Surface Elevation	91.55	ft
Flow Area	3,058.89	ft ²
Wetted Perimeter	1,018.21	ft
Top Width	1,014.93	ft
Height	3.55	ft
Critical Depth	89.95	ft
Critical Slope	0.045165	ft/ft
Velocity	3.27	ft/s
Velocity Head	0.17	ft
Specific Energy	91.71	ft
Froude Number	0.33	
Flow is subcritical.		
Water elevation exceeds lowest end station by 3.01 ft.		

Cross Section Cross Section for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\chalfant.fun2
Worksheet	Approximate FP
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data	
Wtd. Mannings Coefficient	0.058
Channel Slope	0.003700 ft/ft
Water Surface Elevation	91.55 ft
Discharge	10,000.00 cfs

